THE AMATEUR'S BOOK OF THE DAHLIA

Mrs. Charles H. Stout

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THE DAHLIA

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THE DAHLIA

BY
MRS. CHARLES H. STOUT

INTRODUCTION BY
MRS. FRANCIS KING

ILLUSTRATIONS FROM
PHOTOGRAPHS AND DRAWINGS

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TO

MY DEAR HUSBAND

WHOSE CONSTANT SYMPATHY AND ENCOURAGEMENT
HAS HELPED TO MAKE THIS BOOK POSSIBLE

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Last, and by no means least, I thank the publishers for their patience and kindly interest in launching me upon my maiden voyage on the great sea of garden literature.

FOREWORD

For you, dear friend, amateur of the dahlia, this book is written.

You are rich, beyond millions, with God's treasures; yet you know it not. Your wealth is stored away, and this key is made to fit the lock of your treasure house. Your questions, asked, often with shy apologies, needed no apologies; they taught me how to fashion the key, and I am grateful.

So open wide, dear friend. Take these, God's gifts, for the asking. One flower cannot represent the race; one variety is not the whole species. Have abundance—and share it with all who come your way.

Plant your seeds and your bulbs, and the great Artist will come down and work with you. Your hoe will become a wand, and beauty will spring from the dead brown earth which you have touched. He will break up the rainbow and paint the blossoms with the pieces; and you will feel a thrill of joy at thought of partnership with Him who made the world so beautiful.

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INTRODUCTION

Partly because of a long-established belief in the value of the study of special flower groups, I am happy to see appearing this volume on the dahlia; on that flower which has certain qualities pertaining to no other, and a glory of form, habit, and colour all its own. I believe in special plant societies. Study, research, and experience under such auspices spread knowledge accurately and widely with the result that fine plant subjects reach the average amateur with a promptness otherwise impossible.

Notable achievement in America in the way of hybridizing by amateurs is rather rare. We find few men and women, not in commercial growing, who care to give their time and patience to such work as this. It is, therefore, all the more remarkable that Mrs. Stout should have spent already ten or twelve years in her occupation with the dahlia. I well remember seeing for the first time some of her noble flowers, Sunshine, Emily D. Renwick, Gertrude Dahl, and J. Harrison Dick, a dahlia named by the Ameri-

can Dahlia Society for a man whose nobility and sweetness of character were only equalled by his knowledge of all that is best in gardening. These dahlias were among others at an Annual Dahlia Show of the Short Hills Garden Club—that show which has won for itself everywhere a name for keen intelligence and picturesque beauty.

Of all late-blooming perennial flowers, where is there any to surpass the dahlia? Where is there a more majestic habit, a finer foliage in colour and form, or a more glorious range of colour in the flowers themselves? Dahlias have colours given by no other perennial flowers, and this colour is at its finest when that of most hardy flowers has vanished. A trial of dahlias for decorative effect in the garden is taking place this summer at the gardens of the Royal Horticultural Society at Wisley; here the plan is not to disbud or thin, but to allow the plants to grow naturally.

The chapters of this book, based as they are on sound knowledge, spiced with humour, fortified by experience and by experiment—a totally different thing—will, I am convinced, do much for the progress of dahlia growing and hybridizing. But the general impression of Mrs. Stout's writing is this: it is not only a cup of knowledge

but a cup of delight—one that brims over and whose overflow refreshes and stimulates others in the pursuit of dahlias old and new, in the pursuit of dahlia growing with all its attendant and varied interests. The garden work that flowers in writing means a permanent benefit to the gardening public—and not one of our fine amateurs is better qualified to discourse upon the dahlia, its history, cultivation, and hybridizing than the author of this book. Naturally, public recognition has come to Mrs. Stout in a very large measure. A mention of the numbers of silver cups, the medals, trophies, and ribbons which her flowers have captured during the last few years would sound extravagant if it were not true. The money from the sale of these dahlia roots and from her own lectures on the dahlia—lectures with beautiful coloured slides—has gone without exception to the support of French war orphans, to the Fund for Devastated France, to the Maisons Claires, and lately, some of it, to a hospital in Shantung. Mrs. Stout thus remains a consistent amateur of the dahlia, and none will deny that this record glorifies even her superb achievements as a hybridizer and a grower of her special flower.

How well I recall my sensation on seeing for the first time one of the new dahlias, of the

large-flowering type! It was in a florist's window in the Bellevue-Stratford, in Philadelphia, and the dahlia was Geisha. It is years since that day, but the sense of stupefaction (yes, just that) is still fresh with me; a sense that soon gave way to wonder and then to joy that such a thing could be in flowers. Since that time we have almost ceased to marvel, so many glorious creations have come beneath the eye. But the miracle of hybridization is still ours to work as shown by the writer of these pages; the path is only explored for a little. On that path this book should prove a torch to light the way—a gleam which it is hoped many will follow. Dahlia culture in America will then surpass even its present fine status and create for us a special place in the world of horticulture through this race of magnificent flowers.

Louisa Yeomans King.

Alma, Michigan,
June, 1921.

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CHAPTER I

HISTORY

MORE than a century before our Puritan ancestors brought the little *Mayflower* into muddy Plymouth Bay, a handful of sturdy Spaniards stepped upon the mainland which we now call Yucatan. Adventurers they were, in search of gold and treasures, but prepared, nevertheless, to meet fierce savages and hostile tribes of an unknown wilderness.

To their great surprise they found that the natives of this promising land were intelligent and in an advanced state of civilization. They were well governed, with a remarkable code of laws. They dwelt in villages, and sometimes in large cities. They were expert metallurgists, agriculturists, and horticulturists. Their art was not crude; the craftsmanship of their goldsmiths exceeded anything which a Spaniard had

ever done. Their houses were well built and of wonderful design; and, moreover, they planted beautiful flower gardens about them.

The tales which these men had to tell, and the trophies which they carried back, brought many other bands of Spaniards. Finally, in 1518, Hernando Cortez penetrated into Mexico itself and soon conquered this marvellous land and founded the colony of New Spain.

So impressed were the Spaniards by all they found that in 1570 King Philip II sent Francisco Hernandez to study the resources of that country. There he undertook to write a book describing the plants and animals which he had found ("Plants and Animals of New Spain"); but it was not published until 1615, long after his death. Only the edition published in Rome has the drawings which he made with such care.

This book shows two specimens of dahlias which he called by their Aztec names, Acocotli and Cocoxochitl, meaning "Water-pipe" or "Water-cane," and "Cane-flower."* Hernandez was neither a botanist nor an artist, and it is not easy to trace any similarity between his drawings and the wild Mexican dahlias of to-day. The first was a duplex dahlia and the second, undoubtedly, a peony-flowered type. Both had

*"Notes on the Genus Dahlia" by Prof. W. E. Safford, "Journal of the Washington Academy of Sciences," Vol. 9, No. 13.

probably been drawn from specimens cultivated in the gardens of the Aztecs. He states that there are many more forms which also vary in colour through all the shades from white to yellow, purple and red.

The great French botanist, Nicholas Thierry de Menonville, was sent to Mexico in 1787 on the dangerous mission of learning the secret which the Aztecs had of cultivating the cochineal insect. He reported then that he had seen the Acocotli growing in a garden as a cultivated flower. In 1789 the first seeds reached Europe.

Vicente Cervantes, who was director of the Mexican Botanic Gardens, sent to that splendid priest and ardent botanist, the Abbé Cavanilles, director of the Royal Gardens in Madrid, the first ancestors of our gorgeous modern dahlias. These seeds produced single flowers of brilliant hue such as grow in myriads over the high volcanic plateaux surrounding the great "Valley of Mexico"; but by careful crossing and selection were soon giving flowers of many forms and colours.

Andreas Dahl was a great Swedish botanist living in Berlin. He had been a pupil of the great Linnæus, and in 1787 had published a book on the *Systema Vegetabilium*, which commanded the attention and respect of all Europe.

Two species of Acocotli, drawn by Hernandez—

—about 1575, for his book, published in Rome in 1651

Courtesy of Prof. W. E. Safford

In his honour did Cavanilles name this new plant, adding "*pinnata*" to describe the pinnate or winged leaves.

At that time the Marquis of Bute was British Ambassador to Spain, and his wife took such an interest in this new flower that she begged a few seeds and sent them home for trial there. Plants from these seeds did not survive, and it was not until 1804, when Lady Holland sent seeds once more from Madrid, that dahlias really became known in England.

Cavanilles sent seeds to the various botanic gardens of Europe—to Berlin, Dresden, Paris, and Montpellier. In Germany, despite the honour done to Mons. Dahl, they were for a long time called "Georginen" after Professor Georgi; and even now the catalogues of that country list some of the varieties under that name. However, the name "dahlia" must always stand as having first been given by the great Cavanilles; unless we wish to go even farther back to the native word, "Acocotli."

After about 1810 dahlias became more and more popular, and growers continuously sought to double and improve them. Haage of Leipzig, Hartweg of Karlsruhe, Donckelaar of Louvain, and Lelieur and the Comte de Vandes of France succeeded in producing large full flowers of many

colours, so brilliant that their names were on the lips of everyone.

The *Botanical Magazine* in 1817 pictures a rose-coloured "decorative" type sent to England by the Comte de Vandes, the first illustration we have of this new form.

From that time the popularity of the dahlia grew apace until during the period of about 1840, when it became a veritable craze. Both in Europe and America large sums of money were spent to buy the stock of a promising novelty. The forms were always double; either of the "decorative" type, though vastly inferior to the modern California dahlias (the type in which they so largely specialize), or of the ball-shaped "show" type. Just previous to 1860 interest in dahlias began to wane. Every colour and combination of colours had been accomplished. There were no more fields to conquer. In 1870 the National Dahlia Society was formed in Great Britain with the hope of renewing the flagging interest, and at that time appeared a tiny ball-shaped blossom, originating probably with Sieckmann of Köstritz, which he called "pompon." It attracted wide attention for a time, but the stiffness of all these forms failed to hold the interest of the public, and soon dahlias lapsed almost into obscurity.

Some of our grandmothers still clung to the old round types, and many present-day gardens have a few of these tucked into odd corners, degenerates of the great show days.

It is to these types that many people refer when they state that "dahlias are an acquired taste—like olives." *They do not know!* They have never seen our modern dahlias.

In 1872 one M. J. T. Van der Berg of Holland (as his name denotes), received a box of miscellaneous seeds, plants, and roots from a friend in Mexico whose name is now unknown. They were nearly all dead, having been a long time crossing the ocean, but one dahlia tuber had just enough life in it to send up a promising shoot. It was coaxed along and late that summer produced a brilliant blood-red flower of a shape never seen before. Instead of the quilled petals with rounded margins of bygone days, the petals of this flower were rolled back and pointed; the plant was tall, and the stem was long and strong, carrying the little flower well away from the foliage.

It differed so greatly that it was immediately given place as a botanical species, called "Cactus dahlia" on account of its resemblance in form and colour to the blossom of the *Cereus Speciosissimus* or "Showy Cactus." This original cactus dahlia was named Dahlia Juarezii, in

honour of the then president of Mexico, and by crossing with the parents of the earliest hybrids is now the parent of the varied gorgeous blooms of the present time.

No one knows where Van der Berg's friend found his dahlia root. No flower like it has ever been seen either wild or cultivated in any part of Mexico. It may have been a hybrid created by someone there or it may have been a freak of nature in God's own garden on the mountain sides. Nevertheless, it is due to this blossom alone that the waning interest in dahlias sprang into renewed life.

Interest in America grew and waned and grew again as it had done in Europe. Mr. J. W. Harshberger in *Science* (Vol. VI. No. 155, p. 909, 1897) states that the American Dahlia Society was founded about 1895, and planned to standardize classes and varieties, to keep a check list of names, etc., and do much to further the culture of that beautiful flower.

What became of the original society is not known, but we may surmise that it had been crushed by the weight of its responsibilities. However, out of the ruins has risen another American Dahlia Society, which, though still in its infancy, has achieved much during the six short years of its existence.

Its check list now contains more than five thousand names of varieties to be found in trade catalogues. Its membership increases by leaps and bounds as the enthusiasm grows over this aristocrat of all flowers. Trial gardens are placed in various parts of the country where new types may be fairly tested for the benefit of the public. Its annual shows, and the shows in which it collaborates, draw unprecedented crowds from all parts of the country.

The dahlia has come to stay.

Recent investigations made by Mr. C. Harman Payne, F. R. H. S., have brought out the fact that Lady Bute introduced the dahlia into England in 1798, not 1789 as has commonly been accepted.

CHAPTER II

EARLY DAHLIA CULTURE

OUR dahlias owe much to the early struggles of the Abbé Cavanilles. His young manhood was devoted to his Church; but his love of flowers and his botanical writings led to his appointment in 1801 as director of the Royal Botanical Gardens in Madrid, with which he had already been connected for some years. This position he held until 1804, when his untimely death carried away the lovable priest, one of the greatest of botanists—the man who brought the dahlia to the attention of the world.

As we know, the Abbé had his first Acocotli blooming in Madrid in September, 1789. He managed to carry on the species by root propagation and the ripening of seeds. We do not know what colours these first flowers were. It may be that more seeds were sent him a year later, and that by applying the pollen of one upon the other he finally succeeded in producing a deep purple flower of what we now call the "peony" type. This blossom is pictured in his

book "Icones et Descriptiones Plantarum" which was published in 1791 under the name *Dahlia pinnata.*

Later Cavanilles mentioned several other species of the dahlia, D. coccinea, D. rosea, and D. bidentifolia. These may or may not have been variations in flowers only, and mistaken for botanical species. Such mistakes were constantly made during the forty years following, and were the causes of many disagreements among botanists of all nations.

Seeds from plants producing red flowers, sent to some other gardens, produced plants bearing yellow or white ones, and resulting arguments like that of Salisbury, quoted here, followed. Roots shipped from Madrid to Berlin, which had produced strong bushy plants, grew plants of tall, slender habit, due to the cooler, moister climate; the quality of soil altered the colour, and controversies, not unlike that between the grower of present time and his customer, ensued.

After 1803, when seeds reached various botanical gardens of Europe, reports and opinions from England and France differed so widely and were so far from the mark, that they are amusing reading nowadays.

The best and most thorough treatise on the

dahlia by a Frenchman comes from the pen of "Citoyen" A. Thouin in the "Annales du Museum National d'Histoire Naturelle" 1804 (Vol. III. page 420). It is accompanied by a fine coloured plate of the three types of dahlias described by Cavanilles.

Thouin states that much gratitude is due to "Monsieur" Cavanilles and to "Citoyen" Thibaud who brought the seeds to the museum, for the plants give a blaze of colour in the garden at a time when little else is in bloom.

The first seeds were started in large pots of rich earth and placed under a bench in the greenhouse at a temperature of 12 to 15 degrees centigrade. They started slowly, but with increased heat grew quickly, and flowered at the end of autumn of the same year. Of the three varieties, *D. pourpre* (*D. pinnata*) was the latest in flowering, but the handsomest—the colour, a deep pansy or plum, and the centre florets attempting to put out "petals."

His deductions were clever, though as we now know, erroneous; but are well worth repeating:[1]

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[1]Abridged translation of Thouin s article.

If one carefully examines the size and formation of dahlia roots, it will be easy to understand that these plants need a fertile clay and sandy soil, and it should be rich in humus. It may be presumed that they need more heat than our climate provides, as Mexico lies under the Tropic of Cancer. The following are some reasons why it would seem impossible for dahlias to flourish in our climate or an even colder one.

1—It is not usual for plants having such tall and delicate stems to grow on high mountains, exposed to weather conditions that would bruise and break them.

Si l'on examine la consistance solide des racines des Dahlias, leur volume considérable et leur configuration, il sera facile de conjecturer que ces plantes ont besoin d'une terre profonde argileuse mélangée de sable gras; et si l'on considère la quantité de fanage qu'elles ont à fournir pendant leur végétation rapide et annuelle, on se persuadera aisément qu'il faut que cette terre soit riche en humus.

D'aprés la latitude du Mexique, situé sous le Tropique du Cancer, lieu d'ou ces plantes ont été apportées, il est à présumer qu'elles ont besoin d'un degré de chaleur plus considérable que celle de notre climat, et qu'il est nécessaire de les conserver dans la serre chaude pendant l'hiver. Mais si les Dahlias croissoient sur les montagnes dont le Mexique est traversé, et où se trouvent même les plus élevées du globe la latitude seroit un indice bien peu certain sur la température qui leur est nécessaire, puisque les régions élevées offrent successivement le même degré de froid que l'on éprouve sous toutes les zônes de la terre en descendant des pôles vers l'Equateur. Il s'en suivrait alors que les Dahlias pourroient vivre en pleine terre chez nous et même sous des climats plus froids. Cependant nous ne le pensons pas, et voici les raisons qui déterminent notre opinion.

1°—Des végétaux herbacés dont les tiges sont aussi

2—Seven or eight degrees of frost cause dahlias to turn yellow and show their sensitiveness to cold air.

3—In our climate their growth only begins in early summer and they need great heat to bring forth flowers.

4—We know to a certainty that the roots of these plants have been frozen in one night of 5 degrees of frost so it may be positively stated that the dahlia comes from the hot or temperate parts of Mexico, and not the cold.

We can still hope to grow dahlias by persuading them to change their habits of growth, starting in the spring and ending in the autumn, for though we have less heat than in Mexico, our summer days are longer and nights warmer, which should give the same average.

hautes et aussi tendres que celles des Dahlias ne se trouvent pas ordinairement sur des montagnes élevées, séjour des vents, des neiges et des tempêtes. Dans cette position, leurs tiges étant brisées à mesure qu'elles croitroient, ils ne pourroient fructifier, ni par conséquent se multiplier; ce qui est contraire au vœu de la nature, et à la sagesse de son plan.

2°—Les Dahlias, exposés chez nous à l'air à une température de sept ou huit degrés au dessus de zéro, jaunissent et annoncent un état de langueur et de malaise.

3°—Ils n'entrent en végétation dans notre climat qu'au commencement de l'été, et il faut pour les déterminer à fleurir, une chaleur forte et longtemps soutenue.

4°—Enfin, nous avons la preuve que des racines de ces plantes exposées à un froid de cinq degrès ont gelé complétement et sans ressource dans l'espace d'une seule nuit; ce qui prouve ou au moins donne de très fortes présomptions pour croire que ces plantes n'habitent pas les régions froides du Mexique, mais les parties chaudes, ou tout au moins celles qui sont tempérées.

Malgré cela, nous ne devons pas désespérer de voir un jour ces plantes croître en pleine terre dans notre climat. Il ne faut, pour remplir cet objet, que les amener insensiblement et par une culture adroitement dirigée à croître au printemps, et a terminer leur végétation à l'automne, au lieu de pousser au commencement de l'été, et de cesser de végéter en hiver comme elles en ont l'habitude dans notre climat. Si la chaleur de notre zône est moins forte que celle du Mexique, nos jours d'été sont beaucoup plus longs, les nuits moins frâiches, ce qui doit établir, dans un temps donné, une masse de chaleur dans notre climat aussi grande et peut être plus forte qu'au Mexique.

He then gives cultural directions and suggestions for increasing stock by cuttings and ends, by stating that the roots will probably be considered edible as a nourishing food.

In England, Dr. John Sims published a charming coloured drawing of *D. pinnata* in "Curtis' Botanical Magazine or The Flower Garden Displayed," drawn in 1803 in the garden of "Mr. Fraser's at Sloane Square." Evidently the flower, grown from seed brought from France, had gone back to the single type, though the colour is the same as that drawn by Thouin. Doctor Sims states that it is a native of South America, and should be treated as a "hardy herbaceous perennial!"

Evidently, the English had already corrupted the pronunciation of dahlia, for in 1804 an article on the dahlia in "Andrews' Rare Plants" (Vol. VI) one is cautioned against confusion with the dalea, an edible root, named after an Englishman called Dale. Fortunately, we in America respect the "h" in the great botanist's name and such confusion is not likely to result. Andrews also makes the astounding statement that the dahlia is a valuable hardy plant, a native of Peru!

But the most delightful of all these treatises is one in the *Paradisus londinensis*, accompany-

ing Plate XVI by R. A. Salisbury on *D. bidentifolia*, and should be quoted verbatim;

> The specific character and descriptions of Cavanilles seldom do him any credit, and respecting this Dahlia, he has blundered as usual; for its leaflets are neither more acuminated than those of the others, nor smooth on their lower disk, and the ligulated florets of the second variety are of a *deep marigold* colour, *not scarlet* . . .
>
> The variety with yellow flowers has only been lately introduced into this country from Madrid by the Right Hon^ble^ Lady Holland, and flowered for the first time this Autumn.

Poor Cavanilles! Had he but named his dahlia "Variabilis" in the beginning and left it so, this Englishman might have given him a better reputation. What would either of these men think if they saw the dahlias of to-day!

Gradually our predecessors learned how to grow dahlias, to hybridize and improve them. They were doubled to form the "decorative" type, showing no centre florets at all; then again doubled until they became spheres—the "show" type.

Dahlia enthusiasm soon became a veritable craze, and the score of points for perfection became more and more difficult.

In "Every Lady Her Own Flower Gardener," published in 1855 by Louisa Johnson, there ap-

pears under the heading of Dahlias the "Requisites for a Perfect Flower:"

1st. The general form should be two thirds of a sphere or globe. The rows of petals forming this globe should describe unbroken circles, lying over each other with evenness and regularity and gradually diminishing until they approach the top. The petals comprising each succeeding row should be spirally arranged, and alternately, like the scales of a fir cone, thereby concealing the joints and making the circle more complete.

2nd—The petals should be broad at the ends, perfectly free from notch or indentation of any kind, firm in substance and smooth in texture. They should be bold and free, and gently cup, but never curl or quill, nor show the under sides; they should be of uniform size and evenly and proportionately diminishing until they approach the summit, when they should gently turn the reverse way, pointing toward and forming a neat and close centre.

3rd—The colour in itself should be dense and clear; if in an edged flower, concentrated and well defined; and in both cases penetrating through the petal with an appearance of substance and solidarity.

4th—Size must be comparative.

Imagine whipping God's creatures into such monstrosities as this! Is it a wonder that soon after that interest flagged because human nature rebelled at calling such a flower beautiful?

For twenty years dahlias waited—and then came Juarezii. Hybridizing began again, but

with other ends in view. At last the "Countess of Lonsdale" came into being, and the versatility and beauty of the dahlia made itself evident.

And now what have we?

So many forms we cannot classify them.

So many colours we cannot describe them.

So many varieties we cannot name them.

So many admirers we cannot count them!

CHAPTER III

SITUATION

MEXICO, though placed within the tropical zone, possesses by strange freaks of Nature nearly every variety of climate found between the Equator and the North Pole. It is this which our predecessors did not understand when they struggled with the precious seeds sent to them from that far-off land. It was this subject on which their friends out there did not trouble to enlighten them.

The eastern part of Mexico, bordering the entire Atlantic coast and reaching fifty or sixty miles inland, is called the "Tierra Caliente" or hot region. There are found vast stretches of sandy plain, parched with the blistering sun, alternating with almost impenetrable forests. The air is heavy with the odour of exotic flowering shrubs and vines, of dank earth and rotting vegetation. Vicious biting insects are waiting for their prey. The heat is unbearable.

Suffocating, and dreading the malaria and

deadly "vomito,"[1] one is glad to leave it to enter the higher, purer atmosphere. Four thousand feet above the ocean level there stretches out another country called "Tierra Templada" or temperate region, whose vegetation represents that of the southern temperate zone. The natives grow here their crops of corn and sugar cane, and cattle graze contentedly among the hills.

Pushing farther on, some two hundred miles inland, always climbing higher, brings us to that vast tableland, six thousand feet above the sea, which the Mexicans call "Tierra Fria" or cold region, and whose climate is unsurpassed.

Cold it seems indeed with the thoughts of Vera Cruz and Tampico still fresh in mind, though the mean temperature both summer and winter averages but 60° Fahrenheit. The air is exceedingly dry, but the daily thunder showers during the "rainy season," or summer, keep the vegetation rich and plentiful.

Across this great plateau lies a chain of volcanic mountains whose peaks, covered with eternal snows, cool the level lands below. Farther inland, midway between the two oceans, lies the famous Valley of Mexico where stood the ancient cities of Mexico and Tezcuco. The

[1] "Yellow Fever."

slope of the Sierra de Ajusco, south of the Valley of Mexico, is known locally as the Pedigral or Stony Place, where lava beds of centuries ago still hold the fantastic forms they took when these mountains were venting their fury. There the dahlias flourish in all their glory—acres and acres of them in every hue and colour.

Three of the eight species of dahlias known to grow in Mexico are to be found here. Of the others, some grow in even higher altitudes, and some in other localities. Of these, *Dahlia coccinea* is the hardiest, and was probably what Cavanilles first had in his garden in Madrid.

This Pedigral is not the only place where wild dahlias grow in such profusion. There are many such spots on the volcanic mountain slopes where their roots may delve among the crumbling lava which feeds them and keeps them cool and moist. Low-hanging clouds, swinging among the hills, temper the sun and bathe them with the dew so necessary for their existence.

All during the late summer and early autumn these dahlias keep up their mass of bloom; but in October and November, when the daily showers cease and the "dry season" sets in in earnest, the moisture stored up in the "water-pipe" stem gradually goes back to the mother-tuber and nourishes it until it is time to sprout again.

The tops dry up and crumble into dust, which, forming valuable leaf mould, mulches and feeds them during the next year's growth.

During the summer insects have been busy pollinating the blossoms. One has had a taste from a yellow flower and thence danced over to a red one, brushing the pollen of the first upon the pistil of the second. Seeds have ripened and scattered over the rocks into nooks and crannies and the rain has washed the leaf mould and lava dust over them. In the spring they throw up their tender shoots, and lo! in August another flower is born! It is neither red nor yellow. Possibly, it is striped of both—possibly purple, possibly white—but it is almost never like either parent.

Knowing this much concerning the home and habit of the plant, it is perhaps easier to judge how best to treat them in the higher stages of their development.

We must be guided by the fundamental principles on which their life depends, but always bear in mind that just as civilized man cannot thrive on the food of the savage, so also the garden dahlia must naturally be more exacting than the wild as to its requirements.

But dahlias do not always demand high altitude. The sea-level dahlia farms on Cape

Cod and on the Western Shore in Maryland prove this. My garden stands 400, not 4,000, feet above the sea.

Two things, however, they must have: *fresh air and moisture.* In the land of their origin these may only be found in the Tierra Fria, but farther north such altitude means frost—the nightmare of the dahlia.

Far north in colder climates or in England, where the thin rays of the sun have little warmth, they may be planted near a garden wall which shelters them and helps to keep them warm. In the average American garden, however, the cruel sun must be tempered or the plants will sulk in discouragement.

If it is possible to choose the location, a northeasterly exposure would be ideal; but if that cannot be done, place the dahlias where they may have sun in the morning and shade the latter part of the day. Dahlias are jealous of tree roots. If trees are destined to give that shade, beware, and make them keep their distance.

A free circulation of air among the plants is important. The soft green growth heats up and decays quickly in stagnant air, therefore walls and hedges which shut them in are harmful and should be avoided.

An open level bit of land bathed in the morn-

ing sun; a few tall trees to shade them shortly after noon; a gentle rise of ground at the back perhaps, which will shed its overplus of rain upon the beds, and the site is ideal. Here dahlias will have fresh air and moisture—two important factors in their growth, as has already been said.

CHAPTER IV

SOIL—COMPOSITION AND PREPARATION

IN THE first place, soil is divided into two great classes, though each must be divided again, according to its physical differences. These two great classes may be called "Mineral Soils" and "Organic Soils, or Peat." The former class covers the greater part of the earth's surface, while the latter may be found in swamps or in places where, under certain climatic conditions, an accumulation of vegetation after great length of time becomes available soil.

Peaty soils are composed almost entirely of vegetable matter, with but little mineral, if any at all, contained in it. On the contrary, mineral soils are created through the disintegration of rocks and stones by action of water, frost, or the atmosphere, and need not contain peat to be fertile.

Peat may be divided into two classes—that containing fibre and that which does not. The peat to be found in this country has practically no fibre, and is most useful to mix in our gardens

where either clay or sand predominates. In the case of clay, it helps to divide it, and in the case of sandy soil, it helps toward retention of moisture.

According to Tanner's "First Principles of Agriculture" mineral soils may be divided into five classes, according to their physical differences due to either of two principal ingredients—clay and sand. The table given below explains itself:—

Name of Soil	Percentage of Sand
Sand	80 to 100
Sandy Loam	60 to 80
Loam	40 to 60
Clay Loam (or "heavy" loam)	20 to 40
Clay	0 to 20

Therefore loam as we need it in the garden contains about an equal amount of clay and sand.

We can, of course, go very deeply into chemical differences, but for the present it is sufficient to know that soil may be "sour," and may be "sweet." Either condition can easily be determined by placing litmus paper in the soil when wet. If the paper turns pink the soil is sour, if blue the soil is sweet. Peat and clay are nearly always sour, owing to the fact that there is little or no air in the soil, and thus acids quickly form.

Taking into consideration the natural habitat of the wild dahlias on the volcanic mountain sides, we can quickly understand that the foundation of the soil is disintegrated rock, or mineral soil, combined with decayed vegetable matter.

Lava is melted rock often mixed with burnt rock or volcanic ash, and which has been hardened on reaching the air. This after ages of time is crumbled into dust by action of the elements, forming a very fertile soil. The lava soils in the Mexican highlands are rich in mineral phosphates and potash, which slowly become available as plant food and form the chief diet of the dahlia.

The soils in various parts of my garden are so unlike that each must be treated differently. So it must be with the soils in the gardens of my readers.

It is safe to say, however, that the average soil is deficient in phosphates where dahlias are to be grown: and this substance may in practically all cases be generously added. Whether phosphoric acid is derived from animal or mineral sources, the chemical analysis is always the same; but the different mediums which contain it vary in percentage of content.

"Superphosphates" are merely phosphates

The gentle grace of the Peony type
(Gertrude Dahl)

made, by chemical treatment, immediately available, and in the case of dahlias are unnecessary. Animal phosphates are more quickly available through the action of decay than are mineral phosphates, which are set free by the air and water in the soil. For this reason, ground bone, a substance which contains a high percentage of phosphoric acid (and some nitrogen), is the best medium for phosphates in the dahlia beds in soils which are not originally volcanic.

Potash is also an important factor in the composition of soil for dahlias, and wood ashes is the simplest and best material to mix in the beds for this purpose—especially ashes from hardwoods such as hickory, oak, etc.

Phosphoric acid gives the dahlia a vigorous constitution—a healthy root system and strong stems; potassium enables the plant to withstand the attacks of fungous diseases and, combined with phosphates containing some of the minor elements, such as nitrogen, lime, etc., forms the perfectly balanced ration.

If the soil is stony, sift it through a coarse wire mesh. Tubers like the shelter of a large rock in the mountains, but they do not like a stone in the shoe! Stones interfere with the growth of the tubers.

If the soil is gravelly, dig it all out and replace

with fresh loam. Gravel contains no food element nor does it hold moisture.

If the soil is too light and sandy, add clay and some humus—either in the form of peat, or, and better still, strawy manure from the barnyard.

If the soil is of that wicked clay which bakes and cracks and tends to turn to stone, add fresh sand and all the peat or rotted leaf mould that it will hold.

Remember, according to our table, that in the case of either clay soil or sandy soil, enough of the opposite ingredient should be added to make the quantities about even.

Bonemeal, wood ashes, and peat (or leaf mould, which may be used in its place) added to ordinary garden loam forms as near the ideal diet for a dahlia as the volcanic soil and leaf mould of its original haunts.

The matter of leaf mould might almost have a chapter to itself, there is so much to say. It is Nature's own fertilizer. It is all she uses to feed her own garden year by year; yet we, in our ignorance, destroy it to the value of millions of dollars annually. We complain that barnyard manure is almost unprocurable, that artificial fertilizers are expensive and unsatisfactory; yet we have at our doors the most valuable material we could ask for—only to burn it up!

Please do not burn the leaves this autumn! Instead dig a pit in some out-of-the-way corner. The most convenient size is twelve feet long, eight feet wide, and two feet deep; but, of course, it can be made smaller, to suit the size of the garden. If there are many trees, dig many pits, for above all, save every leaf that falls.

During the summer months drop into the pit the exhausted vines of peas, string beans, etc., and sprinkle a little soil over them if you have any. When the leaves begin to fall rake them up as heretofore. Instead of putting them into neat little piles along the paths and road gutters, setting fire to them and making the air pungent with the smoke, carry them in sacks or barrows and dump them into your pit. Protect them with garden trash, old sod, brush, or bagging or anything handy which will keep them from scattering. If rain does not fall at a convenient time, turn the hose on them. Keep adding to the pile as the leaves fall, and by winter there will be quite a mountain. The snow and ice will weight them down and in melting will decay them. During summer the heat and the rain will continue the process. If you have the time, fork them over once or twice, giving them a good wetting also to help the disintegration. By autumn you will have the finest fertilizer which the

garden could wish for, and practically without cost. If your leaves predominate in hardwoods —oak, ash, hickory, etc.—the process will be much slower than when leaves of maple, elm, gum, etc., are decaying. For hardwood leaves keep two heaps going—one to rest another year while the other is being used and again refilled.

I have heard a number of people say that the first fallen leaves harbour disease and therefore should be burned. This I have never found to to be so in any well-ordered garden. Trees infected with scale, fire blight, etc., show their condition early in the summer. That the spraying and cutting out and destroying of such trees is promptly done goes without saying, and a certain amount of extra care where such conditions exist is wise. Making this a general practice is not necessary.

I can hear someone say: "I have gravelly soil where I want my dahlias and if I am to dig it all out, where am I to get new soil to put in its place?" Here is an excellent receipt for making good soil if you have time to spare and are able to secure a little *fresh* stable manure and some loam or some clay and sand:

Put down a bed about two feet thick of fresh stable manure which has never become heated. If your two-foot pit has been dug, all the better,

as all leaching may thus be saved. Over the manure spread leaves, garden trash, and *all* kitchen refuse, two feet more, and over that six or eight inches of loam or clay and sand. Alternate the three layers, one foot deep each, until the pile has reached a convenient height and the last layer is soil. Wood ashes, lime, or old plaster scattered between the layers of trash will keep the soil from becoming sour, and bonemeal sprinkled in the soil will add greatly to its fertility.

The manure soon becomes heated, breaking down the fibre and tougher materials in the compost, killing all weed seeds, and destroying pupa and insects. Wetting it aids materially in the decomposition, and in a year the finest garden loam in the world is to be had.

The shallow pit is not, of course, absolutely necessary, but it will hold the precious liquid in the lower layers after seeping through the compost, instead of running to waste on the surface of the ground where there is no pit.

The use of coal ashes in the making of dahlia soil is of very questionable benefit. Many think that it contains considerable fertilizing value. Analysis has shown, however, that it possesses only traces of soluble potash and phosphoric acid, and even such analyses vary with the

different qualities of coal. Coal ashes has done so much harm to my dahlias that it is forbidden in the garden now. Perhaps a little test I made five or six years ago may show my reason for this.

Two beds were made side by side, about nine feet square. The original soil was the same New Jersey red clay, sour, stony, and with but little life. Trenching was done, as I shall describe later, and one was lightened with sand while the other received the same amount of sifted coal ashes. Both were enriched with the same quantities of leaf mould and bonemeal. Into both the beds I planted three tubers each of three varieties of dahlias—the same varieties in each, all of strong growing habit. Then I waited.

Dahlias in the ash bed grew slowly. The plants were stunted, the stems were short, the flowers small—their toes seemed to hurt! The roots when dug were much smaller than the other bed, and covered with the limey substance of the ash as though they had segregated it from the rest of the soil.

The other bed grew dahlias as I like to see them: tall plants, luscious foliage and flowers, with enormous roots to dig.

Lime is not necessary in the ordinary garden soil for dahlias. There may be a case when,

in the making of soil, muck or sour peat is incorporated freshly the first year. At such a time a very little lime might be beneficial. My own beds, in all the fifteen years that dahlias have grown there, never have had an application of lime.

The small percentage of lime in bonemeal and the chemical reaction of nitrate fertilizers which dahlias usually receive at the end of summer, is sufficiently sweetening for all their purposes.

Our lovable friend, the veteran of gardeners, Dean Hole, once made a remark which another lovable friend in Oregon since brought up to date, saying: "It is better to plant a ten-cent root in a hole which cost a dollar to make, than to plant a root costing a dollar in a hole which cost ten cents to make."

The hole for the dahlia will cost a dollar the first time if properly made, but it is there to stay.

Choose the location so that the beds may be prepared in the autumn. There are many reasons for this.

We have more time after the summer's work is over, therefore the work will be more thoroughly and intelligently done.

We can more easily procure the ingredients for

the proper soil, and the beds, freshly dug, have an opportunity to settle before planting.

We have just been to the dahlia shows and have seen the most wonderful of all flower creations. We have ordered every new variety which has taken our fancy and we plan to do them all the justice possible. Above everything else, we are going to grow dahlias to beat our neighbours!

Dahlias, with all their variability, are most accommodating as to soil. They will do pretty well in clay soil, they will do very well in sandy soil; but if we are going to beat our neighbours, we must give them a slightly sandy loam to a depth of eighteen inches. There must be no hard clay to squeeze as the tubers wish to expand. The bed must be retentive of moisture, for the "water pipes" must have a source to draw from. There must be a good supply of phosphates to give the plant vigour and a good constitution.

Trenching is the best method for making any flower bed permanent. One can then be sure that the soil is as good at the bottom as at the top and the annual feeding is all that it will need to the end of time.

Few amateurs know what trenching the garden really means. Few garden books do more than mention it in a cursory manner; and only a

The Singles have an artistic appeal for cut-flower decoration

few times in my life have I seen it properly done. Trenching for dahlias differs from that for most flowers in that drainage at the bottom is unnecessary and sometimes harmful, excepting where the beds are liable to be flooded in the springtime. Where roses are grown, the lowest strata of subsoil should either be blasted, or broken stones placed there, to allow the water to flow away. For dahlias that stored-up moisture is precious and must be saved. The subsoil in my own garden is the hardest of hard pan—red clay.

Trenching is really digging a series of trenches—lengthwise or crosswise of the bed as we find most convenient. The first trench should be completely dug out, about the width of two spades—or wide enough to get into while working. The sod and topsoil should be piled to one side in a convenient place, for it is destined to go into the bottom of the last trench. In the average garden there is about a foot of this. Dig down about three feet, placing the subsoil somewhere quite apart from the other. In the bottom of the trench lay at least eighteen inches of garden trash—old dahlia stalks, tomato vines, cabbage leaves—even kitchen refuse, potato peelings, pea pods, egg shells, etc. Over this sprinkle a little wood ashes, lime, or

old plaster if you have it (there is no harm in using coal ashes here, since it is so far down that the dahlia tubers can never reach it), and upon it throw the sod and soil from the next trench as it is being dug, breaking it up thoroughly. This brings up the subsoil of the second trench which is to form the topsoil of the first. In few cases is the subsoil entirely infertile. The addition of bonemeal and leaf mould well incorporated thoroughly aerates it and causes the chemicals in it to become available. Sand, of course, should be mixed with both subsoil and topsoil in varying quantities according to its content of clay; or clay and manure mixed with them according to their content of sand.

Each following trench being merely the next two spade widths of soil adjoining the previous one, it is simple enough to turn the soil from one into the other; but care must be given to the thorough breaking up of the soil and mixing of the ingredients which are to be incorporated. Add bonemeal to the last eighteen inches of topsoil at the rate of one pound to three square feet, but when finished the whole bed must be twelve to eighteen inches higher than the level of the surrounding beds. The green manure at the bottom of the bed will decay during the winter, and the ground will naturally settle.

When the last trench has been dug out, and the bottom packed with the kitchen and garden trash, we must resort to the wheelbarrow to carry the contents of the first trench to it. Topsoil goes in first, of course, and the subsoil following, just as in the others.

Bonemeal may be bought in 200-lb. bags almost anywhere. The finest "bonedust" is not necessary, and is generally wasteful. The next coarser, the kind generally used in the rose beds, is the best, and if it can be got fine enough in the "green" or "raw" state, so much the better. Placed in the soil in November, it decays during the winter and is ready for immediate assimilation by the dahlia roots in the spring.

The soil, if treated annually with bonemeal, will grow dahlias continually. My own dahlias have been grown in the same beds for fifteen years, and are finer to-day than they ever were.

CHAPTER V

PROPAGATION

PROPAGATION is merely a process whereby a given plant may, by one means or another, be increased to as many as desired. There are several methods practised among dahlia growers.

An old French botany, dated 1803, suggests that, in order to increase the dahlia plants and to prevent overcrowding of the roots, the gardener should rake away the winter mulch in early April, and force a spade through the middle of the clump! Thus, it states, by transplanting half the old clump elsewhere, twice as many bushes may be grown.

I have known gardeners, even in these enlightened days, to do this to peonies, and then wonder why they did not bloom. Such murderous methods of division will discourage even the fortitude of the most vigorous of dahlias, and we cannot wonder at the reported losses of plants during the early years of their career in Europe.

During the hundred and fifty years of dahlia culture since its first introduction, we have learned the wisdom of digging and storing the roots every autumn. But oh! next spring!

How many times have I seen men and women of real intelligence dig a large hole in the ground and gently lay into it the whole clump just as it had been taken up in the autumn! It is so hard to dissuade these people from the wisdom of their ways—they have grown dahlias for years and years, and have always done it so!

What is the result of such planting? Practically every tuber formed last year sends up a shoot which is destined to become a plant in itself. From three to ten plants are thus compelled to grow in the space which should have held but one. The roots become crowded and strangle one another. There is not enough available plant food in so small a space to nourish so many hungry children. Only a few survive, and those have only strength enough to reach out with leaves to gather nourishment from the air; the effect is a dense, compact bush with but few if any blossoms on it. What flowers there are are small and poor, and the double varieties, seeming to fear that their species may become extinct, put out a few single or semi-double blossoms, hoping that the

resulting seeds will carry on what their roots cannot.

Examine the clump carefully. You will readily see that the tubers radiate horizontally from the main stalk, and that there is usually a knuckle at the po nt of attachment. As a rule an "eye" is to be found in this knuckle, though it does not manifest itself until spring, when it begins to swell. Each eye wants to be a plant, but it must have a tuber to subsist upon until it is well started in life.

Each tuber in the clump should be detached so that an eye remains connected with it. Often the eye dies in its infancy and these tubers are called "blind." They will grow underground for a while, but not being able to send a shoot upward to breathe and draw nourishment from the air, they soon die of suffocation.

Average clump of tubers ready to be separated. Larger tubers should be cut short where indicated.

Very often eyes are to be found high up on the main stalk. If a blind tuber is left attached to

the stalk and the whole planted so deep in the soil that the eye is six inches below the level, a fine plant will be the result.

The eye must have a tuber to nourish it, and a tuber must have an eye, or there will be no plant. The neck of the tuber is often very slender, and it is fatal to break or even strain it. The circulation between the two seems to travel close under the surface of this neck, so that the slightest injury destroys its life.

This condition can also be used to advantage when two eyes are to be found in one knuckle. If the neck is not too slender, the whole may be split down the middle with a sharp knife, and if the neck is not strained, two perfectly good plants will be the result. Of course if the half neck should become strained the eye connected with it will not grow.

Two instruments are necessary for the separating of dahlia tubers—a pair of very small pruning shears and a sharp-pointed knife with slightly flexible blade. A new cheap kitchen knife, generally used for cutting vegetables, is what I always get. Such knives cost ten cents—they even did during the war—and two or three of them, allowing for breakage, suffices to cut up five or six hundred tubers each spring.

Usually by the end of March or early April

the eyes begin to swell and it is possible to begin operations. Unless there is need to separate the tubers for shipment, etc., it is wiser to delay this as late as possible without allowing the clumps to grow long shoots. If the eyes are not sufficiently prominent, wash the clump off and set to one side in a warm dark room for a few days. They will soon be noticeable enough.

First cut off all broken tubers with the shears, and those whose necks have been strained. If the eyes have developed into long shoots cut them back so that one joint remains. This is to guard against the breaking off of the shoot during the handling of the clump. Should a shoot be broken off, nothing more will develop from the wound. Care must also be exercised not to injure the little eyes by the slipping of the knife, or they also will not develop.

Study the clump carefully. If the eyes have developed on the stock in groups, split the stalk so that there will be a group of tubers connected with each group of eyes. These groups may in turn be subdivided, though often several must be left attached to but one tuber. After planting such groups, and the eyes have grown to shoots four or five inches tall, they may be detached and potted, or even set in the warm

Striking contrasts of colour and form characterize the Collerette

earth. They will grow into splendid plants almost as soon as the others.

In separating the eyes and tubers, select the most promising tuber first. With the point of the knife make small incisions all around the knuckle containing the eye, gradually working underneath and gently lifting out the whole. After one tuber has been cut, those following are more easily removed.

Should a tuber be unusually large, cut it down at least one half before planting, or it will grow poorly and be slow in developing new tubers.

I have said what can be done if two eyes are to be found in a knuckle. A thick-necked tuber can also be divided into three parts by an expert if three eyes are to be found; but if more than that should be in evidence, it is better to plant the tuber, letting all eyes grow as already described.

I have even seen experts cut a single shoot in two, splitting the tuber at the same time. Such an operation is of doubtful value, however, as the wounded shoot in healing becomes hardened, and the circulation of sap is retarded.

The average well-grown clump has from three to ten eyes; and if there are tubers enough and they are skillfully separated, at least as many plants can be made.

A very small tuber, provided it is healthy, will make as good a plant as, if not better than, a larger one. All the tuber is for is to give the shoot a start in life—new tubers will develop directly afterward. The monster tubers, even though they send out thick, strong shoots at first, are not so valuable, unless cut down to less than half. They are the mother tubers of the year before, sometimes two or three years old, and are often hollow. The vigorous shoots soon become hardened and "woody," and blooms from such plants are poor and imperfect. Cutting these large ones down causes the plant to form new tubers, and the old piece disappears during the summer.

Tubers should be very carefully packed for shipment. The eye should be well protected against injury or breakage in case it has grown to any length. It should be kept a bit moist if it is to travel any distance. Some growers merely send them rolled up in paper packed in an ordinary box; and if luck is with the recipient they are still alive on reaching their destination.

The best way, however, is to wrap a bit of moist sphagnum moss around the eye and roll the whole tuber in waxed paper. The paper protects against breakage and keeps the moisture in. Ship small tubers if possible; not because

they are light but because they travel better and the shoot attached does not so easily become damaged. Take no risks with the transportation people, but pack them in wooden boxes; mark the packages both "Fragile" and "Perishable," and insure them for their full value. The life of the dahlia is at stake!

Once in a while we have something extra fine, and we need to have a lot of plants. Perhaps we wish to make a big showing of them in the garden, or our neighbours are begging one in exchange. Maybe they are very expensive to buy, or maybe they cannot be bought at all. The clump, perhaps, is very small, with but two or three eyes when we had hoped to have a dozen. Under these circumstances, we must resort to the rooting of green cuttings.

To do this properly, the roots should be allowed to rest at least a month or more after digging. The tubers undergo a change during the dormant period which gives them better strength to renew growth for the following season.

Select only the strongest clumps from plants which were healthy and bloomed true the summer before. About the first of January the clumps should be placed on the benches of a cool greenhouse (about 65°) and thinly covered with light soil. Water sparingly and shade from

the direct rays of the sun. Some of the large growers use sawdust over the tubers in the place of soil, in order to save the labour of weeding hundreds of feet of bench space. This is not to be recommended for the amateur or in the case of rare varieties, as the tubers, being unable to derive nourishment from the sawdust, become exhausted and are useless for planting afterward. Second cuttings taken from plants grown in sawdust are poor and weakly, and can never give satisfaction. It is a poor method at best, and not one used by the commercial grower except to get plants for his own use.

The length of time which the tuber takes to sprout varies greatly with the types. In from two to five weeks some of the little shoots show three pairs of leaves. I know men who always nip off the end of the shoot as soon as the first joint appears, stating that the terminal of the first shoot makes a poor plant. Unless the shoot is thick and hollow, I do not find this so, but use it as my best cutting. The terminal flower of a dahlia plant is invariably the finest of the bush unless it has been blighted by some accident. If there are many shoots, cut the thickest off close to the tuber when three joints have formed, and root it in a pot of soil.

Cut the sprouts off between the first and

second joint, always leaving one joint on the shoot still attached to the tuber. Trim off the lower leaves from this cutting, and if the terminal leaves are large cut them to half the size to save evaporation. The cut should be

Green cutting as taken from sprout. Leaves and stem to be trimmed where indicated

made close under the joint so that roots may start from both the joint itself and the cut below.

Place an inch of good light soil in the bottom of a box six inches deep, giving good drainage underneath. Fill the box with clean wet sand to within an inch of the top, and place on a bench which has bottom heat, or in the hot bed. Insert the cutting into the sand directly after

trimming, so that the joints which have been trimmed are just covered; but do not allow them to come in contact with the soil at the bottom of the box. A good instrument for inserting the cuttings is an ordinary pot label. Force it down the desired depth and press the sand back, allowing space wherein to set the cutting. Press the sand firmly around each cutting before putting in the next one.

The same cutting ready for rooting

The temperature of the house should be about 65° or 70° with *free circulation of air*, and the cuttings should be shaded from the direct rays of the sun. The sand must, of course, be always damp and warm. Stagnant air and cold, wet sand will cause the cuttings to "damp off."

In about three weeks, sometimes more, some of the cuttings will have thrown out little hair-like roots, which may run into the soil under the sand, and take a bit of nourishment while their slower neighbours are only just commencing life.

Then is the time to pot them. Use a sandy

loam mixed with well-decayed leaf mould or peat, planting in a three-inch pot, and plunging them again into sand on the warm bench. As soon as the little plants take hold of the soil and show signs of growing, they should be set in a cool, bright part of the house or plunged into the cold frame, where they may grow slowly, until it is time to set them in their permanent beds. Slow growth at this stage is of great importance, for it gives the constitution to the plant for the rest of its life. It must have time to assimilate its food; and the growth in the soil, the formation of the baby tubers, is more important than the growth of the leaves.

Do not let the roots become crowded in the pots. Shift to larger pots in order to give them plenty of room, enriching the soil at that time with bonemeal. If the roots become crowded and the tubers form in a twisted mass in the pot, they never seem to untangle again in the garden, and the development of the bush is always affected.

There is an excellent method of rooting green cuttings by filling a three-inch pot with good soil and forcing a thick stick down the centre to make a hole a couple of inches deep. The cutting is held in place in this hole and sand poured in, completely surrounding the cutting, protecting

it from the soil. The pot is then plunged into warm, wet sand in order to root the cutting. Transplanting from the rooting bench is thus obviated, as the plant continues to grow in the same pot from the very beginning. This is often done in the growing of "pot roots," of which more later.

While the first lot of cuttings are rooting in the sand, the joints of the shoots left on the plants have thrown out two new shoots each. These in turn may be taken off when three sets of leaves have formed, always leaving a joint behind.

Every time a cutting is taken, Mother Nature provides two more shoots to take its place. The temptation to go on and on, ever producing more plants, is often too great for a grower to resist. These poor, weak, last-grown plants have caused the death-knell of many a promising variety, for the purchaser will naturally discard them when they fail.

Every tuber is provided with just so much strength. That strength becomes exhausted after many cuttings have been taken, and further plants are weak and sickly. They produce poor flowers and seldom have a tuber which will "carry on" to next year. Four, or possibly six, plants from each shoot is all that is safe to make.

Grafting a green shoot on an old tuber

Green plants are too often condemned as not being so satisfactory as those grown direct from the tuber. This is usually the fault of the grower, and if plants are purchased, the gardener should make very sure of the man from whom he gets them.

Green plants must be started early and grown slowly. Those started late and grown rapidly make large bushes above ground, but they seldom have roots which winter well.

Over-propagation—i.e., too many green plants taken from the mother clump—is too often practised by growers who have more greed than common sense. This is another cause for the gardener's general condemnation.

There is one slip, however, in the growing of purchased green plants, which is the fault of the gardener himself. It is his lack of knowledge as to how to treat the newly arrived baby. The plant was born and brought up with the tenderest care, indoors. It was shaded from the hot sun and given water at regular intervals. Suddenly it was placed in a close dark box and tumbled about for several days, finally to emerge in a strange country. Usually the gardener takes it out of the box and immediately plants it in the garden like a potted geranium.

The poor little plant is tired out after its

harrowing experience, and is frightened almost to death in the large wide world with not a plant nearer than three feet away. Next day the sun is hot and the baby faints away until the gardener gives it a drink of water. Or it is storming hard and the rain and wind beat it and spatter mud upon it—or maybe it is completely washed away!

The newly arrived green plant should be potted and allowed to rest for a week or more in the cold frame. It should be shaded from the bright sun and watered regularly. Gradually "harden" it off, and take advantage of a cloudy day when setting it out in its permanent place in the garden. Even then shading may be necessary if the weather turns hot.

Green plants properly started, grown slowly, and carefully tended during their early life will make as fine and vigorous plants as any grown direct from the tubers. If there are plenty of tubers it is not, of course, worth while to take so much trouble. Where tubers are scarce and the variety is in demand, no amount of trouble is too much if it does not interfere with the health of the plant.

Plants for shipping should be carefully selected. They should always have small tubers, and not too much foliage. Knock them out of

the pots when quite wet, roll the ball of earth in cloth, and tie. (Paper is liable to melt away, allowing the soil to shake free from the roots.) This cloth should, of course, be removed when planting out. Pack in a strong box with excelsior to keep them rigidly in place. If possible, perforate the box for the sake of ventilation, for in all stages of growth the condition paramount to success with dahlias is a *free circulation of air.*

Never use this process for propagating seedlings or very new varieties, no matter how valuable. Propagate them by root division only, and guard the precious plants as you would your family jewels. The vigour of a new variety takes several years to establish. Some have no vigour at all to work upon and should be discarded no matter how beautiful. These are usually the result of inbreeding, though crossed with some other varieties will sometimes make good parents.

A seedling which shows good root system in the beginning, after being increased by division for three or four years, may be propagated sparingly through green cuttings.

It might be better, perhaps, to begin propagating by "root cuttings" before green cuttings are made. This process varies from the others in that after a shoot grows a few inches high, it is

carefully cut away with a tiny piece of the tuber or stock attached, and rooted and grown like any other cutting. The removal of one eye induces another eye, dormant heretofore, to develop, and this again may be removed when grown to the proper size. This method comes midway between propagation by root division and green cuttings, and is not such a drain on the strength of the tuber. More plants may be had than by root division, but naturally fewer than by making green cuttings. It is a simpler method for the beginner.

Grafting has been tried successfully by a number of growers, and in the case of rare and valuable plants is an excellent method, for the strength of a healthy tuber is given to the cutting grafted upon it. The tuber destined to hold the graft should already be rooted in a pot (a discarded "blind" tuber is ideal for this purpose). The cutting should be made from a growing plant. The stem must be cut wedge-shaped and the neck of the tuber cut to fit. The two wounds are placed together, bound with raffia, sealed with wax, and enough soil put over to cover the junction. Bottom heat on the bench will soon cause the two to unite, and a fine plant is the result.

Where the cost of labour must be considered,

this process is not commercially profitable, but the ease with which late cuttings can be made into strong plants should encourage the amateur to try it.

A method of propagation seldom met with in this country is that of making "pot roots." Commercially, it should be profitable, as the roots so made are as easily handled as field-grown tubers, and make quite as fine plants. There is not nearly as much loss in handling them as there is in the handling of green plants, and as cuttings for them are usually taken from plants growing in the field, they are stronger and more easily rooted.

They are rooted in sand, planted in four-inch pots, are plunged close together in the ground, and grown as slowly as possible all summer. When frost threatens they are lifted into the greenhouse, watered regularly, and allowed to grow on. The soil in the pots should be friable, so that tubers may develop easily, and every flower bud should be cut off promptly to encourage root growth. When in January plump little tubers have formed, watering is done sparingly, and finally ceases. The tops dry up, and the pots are set out of the way, in the cool storage room, until needed in spring.

The amateur who has no greenhouse may

overcome this difficulty by merely starting a couple of months earlier, making the cuttings direct from the clumps, as in the case of the green plants used in the garden.

Remove the clumps from the sand about February first and place in the warm dark cellar. Sprinkle or syringe daily, keeping them damp for about a month, until the eyes have developed. About March first place in a half-spent hotbed, the soil over the manure being mixed with an equal amount of sand. Too rich soil will induce rot in the tubers, yet to produce strong plants they must have food. About April first the clumps will have sent up their shoots.

Make the cuttings, root, and pot as I have described for plants, but as soon as danger of frost is past, they may be plunged, pot and all, close together in the open ground. Growing slowly is important, and by the time frost has nipped them the pots contain the fat tubers wanted.

One or two eyes always develop on these roots, and, planted directly in the garden like any other tuber, they give perfect satisfaction.

Never propagate green plants from a clump which was originally a green plant the year before.

Never propagate pot roots from plants in the

field which were made from green cuttings the winter before.

Never propagate green plants from pot roots. This is over-propagation.

Use only strong, field-grown clumps for propagation which have been grown from divided roots for at least two generations, and which have produced the finest blooms, true in form and colour.

I cannot too strongly urge, however, that by whatever process propagation is carried out, the matter of careful labelling is of the greatest importance. When cutting up the tubers, a wooden label with copper wire should have the name clearly written upon it. The wire may be pricked directly through the tuber itself without any injury to it and securely fastened before laying it to one side.

In rooting cuttings in sand, if many of one variety are to be grown, a box for that variety alone should be provided, and a large garden label placed in it in a conspicuous position. If only a few cuttings each of a number of varieties are to be grown, set the cuttings into the sand in rows, placing a pot label with the name of the variety at the head of each row.

When the plants are potted, force a stick about eight inches long into each pot, and to it

fasten a copper-wired plant label bearing its name. This label may be attached to the dahlia stake when the plant is set out in the garden later.

If labelling is deferred, or carelessly done, there is no end of trouble later. "A stitch in time saves nine."

CHAPTER VI

BREEDING

THERE never was a lover of dahlias who sooner or later did not "try his luck" in the production of a new seedling. Most of it is haphazard work—just saving a seed pod—and if one plant produces a fairly good bloom, lo! another goose becomes a swan!

There are more than five thousand named varieties known to be on the market and officially listed by the American Dahlia Society—and they have not stopped counting yet! Many varieties are as alike as twins and some so inferior that they should not be allowed to continue. Some varieties are sold under two or three names, and sometimes the same name is given to two or three varieties.

Nevertheless, dahlia breeding should go on, but it should be done intelligently and the standard looked to should be high—our patience should be as great as our ambition. It takes years to produce the fine variety which some people think they can produce in a few months.

Undoubtedly the growing of plants from seed is the most alluring of all phases of dahlia culture —we can never be certain what we shall get. From the day the little green sprout cracks through the soil and smiles a cheery "good morning" we are in a state of suspense. What will it do? Will it be a peony, a decorative, or a cactus? Will it be white or pink or yellow or red—or (and many of us have had dreams!) a heavenly blue? For months it does not divulge its secret. Then the buds form. They swell. To-morrow, maybe, they will show colour. We get up early and rush down to see and find——? Maybe it's magenta—possibly red and yellow—or pink. It might be double, or it might be single. It is hard to tell, for dahlia blooms open slowly; and early in the morning only a petal or two will have broken free. By afternoon we are sure, and will either root up and destroy the plant—or stand and worship.

There is little enough we have of definite knowledge concerning the breeding of new types and varieties. Recent investigation shows that a certain amount of inbreeding with careful selection is beneficial in plant life. It is this which has established every new type. Constant inbreeding in dahlias, however, is a waste of time. Poor keeping qualities of root systems

are traceable to inbreeding—roots which are slender and fibrous, and which unnecessarily dry out quickly. Pendulous flower heads due to weak stems, shy blooming varieties—all have related parentage. The European varieties of incurved cactus dahlias have had all these defects, but lately fresh blood has been added and the newer ones are as vigorous and free as any one could wish. When we want to improve the stem, colour, root systems, or any defect in a given variety, we must give it the strength of an entirely different type. Many breeders go back to the original Juarezii or some of the wild dahlias of the mountains. It takes several generations to do this, and men have spent half a lifetime before they have satisfied their ambitions.

Back in Mexico there are species of dahlias which have never been used in breeding. Think what possibilities are hidden in their pollen! In certain parts of Yucatan there are dahlias which are not herbaceous, but grow to be shrubs and even trees. The natives chop off branches and stick them into the ground, and they root as easily as a willow. One of these tree dahlias is called "Imperialis" and now thrives in the warmer parts of our country where there is no frost. It is tall and slender in growth;

and late in November bears clusters of pure-white flowers on pendulous stems. Men in California are trying to cross it with the herbaceous varieties in order to give it colour and erect stem.

There is another variety, but newly discovered in Guatemala, of this tree type. It has an upright habit and bears aloft pink or white flowers of large size and good substance. Most are single, but some bear semi-double blooms. A great future has Dahlia Maxoni; and one of these days we may sit under its shade while the birds are singing in the branches! Carolina, Georgia, southern Tennessee, and northern Alabama in the East; parts of Texas and southern California in the West will soon find these tree dahlias bearing double flowers of exquisite form and colour. But we must wait for the man or woman to learn the means of doing it. I doubt if ever the North will see a tree dahlia in bloom except under glass.

Then there comes the matter of fragrance. A very few peony-type dahlias have a faint fragrance, slightly resembling that of a water lily. Their seedlings seldom do, though there is no reason why, by careful selection, the fourth or fifth generations of fragrant parents might not give a really perfumed flower.

The dahlia is well named "Variabilis." It is unreliable to a greater extent than any other type of flower, and brazenly defies nearly all the laws of heredity.

I wonder sometimes what conclusions the great Mendel would have come to had he begun his experiments with dahlias instead of peas.

Unfortunately, of the thousands of beautiful varieties growing in our gardens there are practically no records which are of any real value. There are no "family-trees" to study!

We know that the dominant form or colour persists in the seedlings, yet in the dahlia the blood of ten generations back will reappear most unexpectedly. I have fertilized a yellow dahlia with pollen from a pale pink, and one of the seedlings was scarlet. I have pollinated a blood-red dahlia with a scarlet, and have had a flower nearly white. I have placed the pollen of a hybrid cactus upon a peony and have had a decorative among the seedlings.

The best we can do is to follow the tendency of the dominant colour or form. This law of Nature is simple but, like the French grammar of our school days, there are as many exceptions as there are rules!

My own experience has been that the pollen parent governs the size and form, and the

seed parent controls the colour in more or less greater degree. Seedlings from a pale flower bear a majority of pale flowers and vice versa. I have spoiled many an experiment by placing pollen from a peony of fine colour upon a superbly formed cactus, hoping to keep the form and change the colour; but when I have turned about and placed the cactus pollen upon the peony, the percentage of good colour has been much higher, with better form and size. This rule is not borne out in other classes of flowers, and in dahlias has been far from infallible; but the large majority of my seed pods during the last fifteen years havebehaved themselves that way.

The first generation plants from a fine seed parent seldom bear flowers equal in form and colour to either parent. Selecting the finest from the first generation and pollinating the flowers of that from some other very fine variety will often bring one or two seedlings surpassing either parent. If the second generation should fail, the third, through *careful selection* and wise pollinating, rarely does. At least there should be one fine plant.

These flowers, however, may so closely resemble a variety already on the market that after all the plant is worthless, and we must begin all over again.

Many growers who have large acreage are not satisfied to wait so long, and prefer to use the pollen from the finest decorative and cactus varieties upon a fine open-centred peony flower. They tell me that about seventy-five per cent. or more of these seedlings will bear splendid cactus or decorative varieties, but out of ten thousand such there may be only one which is totally unlike any other dahlia grown.

Among the cactus, decorative, and show varieties there are a number which, although forced to bloom an open-centred flower, bear pollen which is sterile, or at least which will not combine with the stigma of a selected variety. Their pistils, if they have any, refuse to accept the pollen of another, and so they never set seed. Such plants, I find, have strong, vigorous roots, and there is *no need for nature to provide seeds.*

Working on this theory some years ago, I planted some roots of Délice and Gustav Doazon, both noted for their sterility, in boxes of rather poor soil, plunging the boxes in a hot, sunny part of the garden. This was done so that the roots could not expand. The plants grew slowly, and in August I gave them some nitrate of soda to stimulate the blooms. Délice gave three blooms, two of which were duplex, the third almost full, yet showing a centre.

Gustave Doazon gave four blooms, only one of which would set seed. The seedlings of these (bee crossings) were of no value and were destroyed, yet their performance satisfied me that Nature tries to provide for the continuance of the species by one means if the other shows a possibility of failure.

Nature's method of pollinating by means of bees and other insects is the surest way of getting the most seeds and the strongest plants. This is usually a jump in the dark, but Nature can be guided a little by planting side by side the varieties desired to be crossed. Further than that, flowers can sometimes be tied to face each other closely. Bees will naturally dance from one to the other with their burden of pollen, and the wind will carry it also.

Nevertheless, we cannot guard against the bees and the wind bringing undesirable pollen as well. Unfortunately, undesirable pollen often is more effective with the stigma than the pollen we prefer, and the resulting seedlings are disappointing. We must plant thousands of seedlings in order to get one which possesses all the qualities we desire—think of the labour!

Now let us study artificial pollenizing. Definite results can never be depended upon with dahlias. They are mongrels and "blood will

sometimes tell" even to the twentieth generation. Albeit, 'tis a short cut to our destination.

A little study and practice is necessary. Look at the blossom carefully—it is called, botanically, *compositae*. The yellow disk, if examined under a magnifying glass, is composed of dozens of little florets, each containing its pistil, or mother, and its surrounding five stamens, whose anthers bear the precious pollen destined to fertilize another flower. On the pistil sits the stigma, ready to receive and make use of the pollen which will create the fertile seeds. As each floret opens, the pistil pushes its way up through the case, forcing the anthers apart, carrying the pollen on its back which soon scatters or is carried elsewhere by the wind or on the backs of insects. Gradually the stigma on the pistil opens wide like a mouth, disclosing a hairy interior which will catch and hold the pollen received. The outer ring, or ray-florets, are usually only pistillate, and for that reason make the best seeds. They are the first to open and to become fertilized, and draw more strength from the plant in the process of ripening. This is especially so in the case of double flowers.

Just before the mother flower, or seed bearer, breaks open, it should be covered with a large, light paper bag. Each day a row or ring of

florets will open and should be promptly pollinated, and the bag replaced.

Nature abhors self-pollination, and provides against it to a certain extent where Nature's methods are used. But Nature is not prepared against the interference of human beings in her private affairs! Our big clumsy hands and the clumsy instruments we use are just as liable to tumble the pollen from the anthers of one of the florets upon its own pistil or the pistil of its twin sister. The resulting seedlings give nondescript blooms, usually single and of bad colour.

To obviate this, all pollen must be removed from the florets of the mother flower before commencing operations.

The best method is to throw a fine jet of water directly upon the florets, which will wash all pollen away from the opened anthers and from the pistils on which any undesirable pollen may have fallen. It has been proven that pollen may lie upon the stigma for half an hour or more without taking effect.

Examine the florets carefully with a magnifying glass to make sure that every grain is washed away, and then touch the surfaces with shreds of very absorbent blotting paper. This will take up all the superfluous moisture, and the stigma is ready for its application of pollen.

The best instrument for depollinating is a rubber bulb, such as is used for atomizers, into which has been inserted a tube of glass, metal, or hard rubber, and which when filled and pressed will throw a threadlike jet of water. One can purchase such an instrument all ready-made at a supply shop for dentists. We all know them—they need not be described!

Two such bulbs and a small pail of clean water is ideal. One bulb, pressed and placed in the water, may be filling while the other is being used.

The day before pollinating is to be done, the male parent (i. e., the flower from which the pollen is to be taken to fertilize the mother flower or seed bearer) should be cut from the plant, brought into the house, and placed in a vase of fresh water. Bees are early risers and their breakfast often consists of pollen from the finest blooms. Unless we get up before dawn, we must resort to this wiser method.

Next morning the anthers will be full and fluffy with the golden powder which we need, and it is an easy matter to gather it upon some small receptacle—a watch glass seems to be the most convenient—with a soft camel's hair brush.

Take it to the garden along with the rubber bulbs and the pail of water, and as soon as the

mother flower has been depollinated and dried, apply at once. Use a camel's hair brush which has been dipped in sugary water and pressed flat and smooth. The pollen is easily lifted from the watch glass and deposited upon the stigma. See that every part of each pistil is well coated with pollen, and bag the flower at once, so that no other pollen may reach it. Next day, and for two days more, this process may be repeated as each ring of florets expands in turn, if many seeds are needed. It may be necessary to cut a new pollen bearer each time as there is some doubt as to the fertility of the pollen, and the vitality of the resulting seed, if the flower stands long in water. Bag the flower each time and allow the bag to remain until the seed pod begins to form. Pull off the petals directly they begin to fade so that the seeds in the pod receive all the strength and vitality possible.

If it should not be convenient to gather the pollen and apply with a brush, excellent results can be obtained by merely touching the two flowers together so that the pollen may be brushed off from one directly upon the other. This is difficult, however, if the pollen bearer is a full-petalled flower with the stamens deep in the centre, unless some of the central petals are carefully removed the day before.

Either method should be used during the early part of a bright sunny day before the flower feels the heat too much.

If the weather following should be damp, the bag must be removed and risk taken as to undesirable pollen. This is especially necessary if the flower has many petals and is liable to hold much moisture. Seeds will otherwise rot rather than ripen and it is better to risk a few undesirable seeds rather than complete loss.

Of all types to grow from seed, the most difficult is the incurved cactus. A letter received a short time ago from one of the largest breeders of this type in England stated that out of nearly nine hundred seed pods fertilized during the previous season, only 350 seeds germinated. They are so inbred that they cannot reproduce.

The anemone-flowered types are practically impossible to pollinate. The long tubes are too slender for us to reach with an instrument the tiny stigma. Some people have tried cutting them off, but the stigma seems to resent this from me and refuses to accept the pollen. It takes a long-tongued insect to reach in there, and even then they are not very successful.

Seeds from flowers pollinated late in the season are the more satisfactory. They germinate better. The resulting plants are of finer con-

stitution and bear flowers of better colour and habit.

The latter part of August is early enough to begin. Plants are then in their full strength and vigour and can put their best efforts into the development of the seed during September. Do not grow too many seed pods on one plant if you want flowers also. One or two is plenty.

It is of greatest importance that the seed pod is protected from frost until it is quite ripe and dry. It is full of sap which feeds the seeds until they have achieved full development. Then the stem closes its "water pipe" so that no more need come from the reservoir down below, and becomes dark in colour. This is a signal that we may cut it and allow it to dry quickly in the sun if it does not dry fast enough on the plant itself—for it must dry quickly if the seeds are not to decay. If these green pods should become the slightest bit frosted, the seed is killed.

Should frost threaten, and the pods are well filled out and of good size, they may be cut on a long stem and placed in a glass of water in the house. Keep them in a sunny window and change the water from time to time. The seeds which have developed fully will ripen and seem to have as much germinating power as though they

had spent the entire time on the plant. I am inclined to think that seeds not fully developed at the time do not develop further.

Seed pods may be tied in light paper bags in a dry place until a convenient time should come to clean them. Be sure to label them carefully with the names of both parents if they are hand-pollinized, giving the name of the seed bearer first. For instance, if the Dahlia "Ballet Girl" is pollinated by "Mystery" the pod should be marked "Ballet Girl X Mystery"—or if vice versa, "Mystery X Ballet Girl." If it is a chance seed pod (i. e., a bee crossing) only the name of the seed bearer can be written.

Break the pod open on a flat white surface—the lid of a box is an excellent place as the edge keeps the seeds from being lost. You will notice that the seeds lie in the inner side of flakes, which are set in circles, just as the florets had grown. The seeds are attached to these flakes and in their wild state sail off with them on the wind, alighting some distance away where they may take root next year. The outer circle of seeds are the largest, though here and there inside the pod a giant or two may be found. They should be about one half inch long, a dark gray in colour, a little curved, crisp, and clean edged, and having a slight plumpness. There will be

many more in the pod, long and thin, the edges slightly white, rather limp in substance. These are undeveloped seeds and will never germinate; the pollen applied was not acceptable, or conditions in one way or another did not allow them to develop. Throw them all away and save only what you know will grow. I have known pods to contain only such undeveloped seeds with the exception of but one; and this one has often grown to a plant of superlative value.

At the present time California is so far ahead of any part of the world in the production of new varieties that our country should be very proud. Dahlias grow there as we can never hope to have them in the East. The climate is cool and the damp west winds bathe the foliage with that most necessary moisture. The soil, much of which is volcanic, seems to contain all the elements necessary for their growth. With such healthy flowers for parents, and a long season for the development of the seed, how can seedlings be otherwise but fine?

This bit of California is not the whole state, by any means. It is only a strip along the coast some four hundred miles long, both north and south of the Golden Gate, and only a few miles wide. In some places, ten miles from the coast, dahlias will not grow, while close to the

sea the fields are a blaze of colour. California is indeed the Promised Land for dahlias.

On the south coast of England the climate is much the same, and two great hybridizers have their gardens there. The soil, though not of the substance of California, is rich in peat and sand, and these gardens are a mass of bloom all summer.

The brains of the man with the camel's hair brush is the greatest factor of all. Where he dwells, whether here or there, the dahlia has its future.

Do not plant the seeds too early. They germinate quickly and grow rapidly. The middle of April is time enough to place the seeds in flats. The flats should be kept in the cold frame or in a sunny window but shaded from the direct rays of the sun. Use a light loam mixed with well-rotted leaf mould or peat so that it cannot pack. Sow the seeds about an inch apart and cover lightly with about half an inch of soil. Water sparingly with a fine rose spray, and above all, keep the weeds out.

Presently two little oblong leaves appear which widen as they grow, and then two more above. When the seedlings have acquired their third set of leaves, they should be pricked out into three-inch pots and grown as slowly as

possible. Never let the fibrous roots become crowded in the pot. Shift to larger pots before this happens. By giving them plenty of root space and causing them to grow slowly above ground, the tubers will form early. Protect against the hot sun, but do not allow the air about the plants to become stagnant. Remove the shade as soon as the sun drops.

An excellent shade for dahlias in the cold frame is a piece of the very coarsest and most open weave burlap, six feet wide and about eight feet long. Tack this at even distances upon three or four laths or strips of wood a few inches longer than the width of the burlap, and fasten a heavier strip of wood at each end. The laths will lie across the cold frame, holding the burlap in place so it will not sag. When not in use, it can be rolled up into a small bundle and laid beside the frame.

By the end of May the plants will be large enough to be set out in the garden. They may be planted in exactly the same manner as plants made from cuttings, and cultivated like any dahlia. It is not necessary, however, to plant them more than two feet apart. There are always "rogues" to pull up as soon as the first bloom opens, leaving plenty of room between the plants for full development.

There is no doubt that giving a seedling the best of soil and good culture helps materially to establish it the first year. If a promising seedling is grown like a prize variety, the result is 100 per cent. better than if given the half-hearted cultivation that most seedlings get.

In my own experience, if a seedling is given the best cultivation in its first year, the second and third year will find it exactly like the first. All that is left to do is to plant it in other soils and climates to see how it will behave. Both have their effect on stem as well as on colour, and as weather may vary each season, never condemn a seedling if it behaves badly during its first summer in a new locality. A second trial may show it in its true light.

The dahlia as a species of herbaceous perennial is undoubtedly in its early stages. It is therefore unstable and can be moulded into almost any shape or form as by a potter's wheel. From the smallest Mignon or Tom Thumb types to the massive hybrid cactus is but a few steps. Therein lies the fascination which keeps us striving for new and better ones each year.

CHAPTER VII

CULTIVATION—PLANTING, STAKING, AND FERTILIZING

THE time for planting dahlias must be controlled by climate and the use for which the blooms are needed. On the Pacific Coast tubers are set in place in mid-April, sometimes even earlier. Green plants are set out during May and June according to the habits of certain varieties and their behaviour at the end of the season. The growing season in that wonderful part of our country covers a period of eight or nine months. Some of the early blooming varieties would be past their prime when needed for exhibition purposes in September unless plants are set out much later than those of slower growth. This is true anywhere, of course, and should always be taken into consideration when dahlias are planted; but wherever the growing season is long, a careful study of the habit of the variety is of greatest importance. In an even climate like that of California this is about the only question which

controls the time of planting. In the East there is another factor which is so uncertain and yet so important that the subject is still open to much discussion. The advice given by growers to prospective purchasers, as published in their catalogues, is contradictory and confusing, and only a clear understanding of these conditions can help the beginner to work out his own salvation.

In our climate, that of the Central Eastern States, there comes a time, the latter part of June and early July, when all the world seems parched and gasping in the heat. We may soak the roots and spray the leaves of our precious plants, but the merciless sun will play havoc with them if they have already reached any size. The leaves blister and curl; their pores close and can no longer draw any nourishment from the air. The stems become stiff and woody and the sap cannot flow evenly through them. Growth is checked; and though when conditions improve it tries to start again, the new leaves are small and numerous and no flowers can develop. The only thing to be done at this time is to cut the plant back at least two thirds of the way; or, if a secondary sprout has appeared from the root, cut the old plant out altogether. This delays the blooming time two or three weeks, but there

is no choice if any flowers at all are to be expected.

Two seasons have gone by when no such situation developed. June was cool and rainy. July was hot—and rainy. August was rainy. Dahlias set out at all times did equally well, and the unusually fine crop of blooms over a prolonged season did much to work up dahlia enthusiasm to the highest pitch.

But the drought of the past summer (1921) caught many gardens napping. Plants which had started early were rattling like a bag of bones by mid-August, and many a beginner became deeply discouraged.

My own method is to begin planting the tubers of slow-growing varieties about May 20th, adding from time to time the others according to their habits known to me. Half the tubers of each variety whose habits I have still to learn are planted early and the rest late, for observation. *Plants* are set out during June, dating according to the length of time the variety takes to begin its bloom—even early July is not too late for some. Plants of Gertrude Dahl, set out in my garden the first week in August, produced blooms which won first prizes in a show on October 3rd. I do not recommend such late planting, however, where one desires roots for

wintering over. The bushes are hurried in their growth and blooms are forced before tubers of sufficient size are developed—and there is nothing left to "carry on."

I have found that dahlia plants when six to twelve inches high can withstand the heat and drought of June far better than those of larger size and active growth. They can quickly assimilate the water given them and with fewer and smaller leaves to support do not suffocate so easily. They soon catch up after the thunderstorms of July and August commence, and by September, when dahlias can give the needed colour in the garden and when the blooms are desired for the shows, the plants are in their full glory.

In the New England States and northward there is still another condition which controls planting time. There the growing season covers but four months or less. Spring frosts may be expected up to early June, and the killing frosts come in mid-September. No serious heat and drought may be expected during the summer, so that in order to produce flowers in August and early September an early start is necessary.

Just as young dahlia plants can better withstand heat and drought, so can they better withstand light frosts. Little plants six or eight

inches high do not suffer at all if the mercury shows 30° for a night or two in succession. The tubers are potted in light soil early in May, placed in a cold frame, and allowed to grow slowly until proper planting time. Care should be exercised, when shifting the plants from the pots to the open ground, to disturb the young fibrous roots as little as possible. Plants made from cuttings may be set out at the same time as the tubers instead of later. In that cool climate the bushes must be hurried into bloom rather than be held back, as is necessary farther south, and everything short of actual forcing should be done to that end.

Unless dahlia roots are stored under ideal conditions, it is very difficult to keep them from starting into growth long before it is time to plant them. I find that separating the tubers will check their ambition somewhat, but after separating they should be buried deep in cool sand until planting time. If they persist in sprouting, the young shoots may be cut back to within an inch of the tuber. Never break a shoot off unless there is another eye to take its place—for nothing more will grow from the wound.

Late in the winter when instinct (and the deluge of catalogues) stirs that indescribable

something within, and tells us that spring is near, I make my planting scheme for the dahlia garden. The list of roots which I had put to bed in the storeroom three months ago is divided into six colour classes: red, orange, yellow, pink, white, and lavender. Lavender even on my list is separated from the other colours by white. To this list I add those which I have purchased and those which my friends have given me. Then on a rough map of the garden I arrange the colours and, after studying their heights and habits, place the named varieties.

At our leisure, long before planting time, the stakes are put in place; and since the soil is already prepared, all is plain sailing when the time comes to put the dahlias in. My dahlias grow tall. I do not pinch them out, as do nurserymen, to avoid staking. I like to cut blooms with stems three or four feet long that they may be held aloft with the grace and dignity they deserve. To this end staking is absolutely necessary.

Buy from a local dealer 2 x 2 rough lumber in twelve foot lengths—of chestnut, if possible. Cut these lengths in half and point one end of each. Paint them with a dark green or brown creosote stain, and dip the pointed end into eighteen or more inches of heavy tar paint. At about six inches from the top of each stake drive

in a strong galvanized staple. This is to hold the label bearing the name of the variety of dahlia planted at its foot. Chestnut is tough, and is cheap in most localities; the creosote stain, if applied each year, protects against the weather; and the tar guards against rot in the ground. Such stakes will last five years or more, are quite inconspicuous when the dark stain is used, and are strong enough to hold the plants against severe gales.

Another method of staking when plants do not grow to great height is by means of ordinary wooden laths. Two are tied together at one end and again about ten inches below. The other ends are pointed, separated, and forced ten inches into the ground on either side of the young plant. The farther the laths are separated, the better is the central stalk thus supported until it reaches sufficient height to be tied where the two laths have been fastened together. This is the cheapest method which is successful, but unless long and heavy laths can be procured, is not sufficiently strong to support the taller varieties.

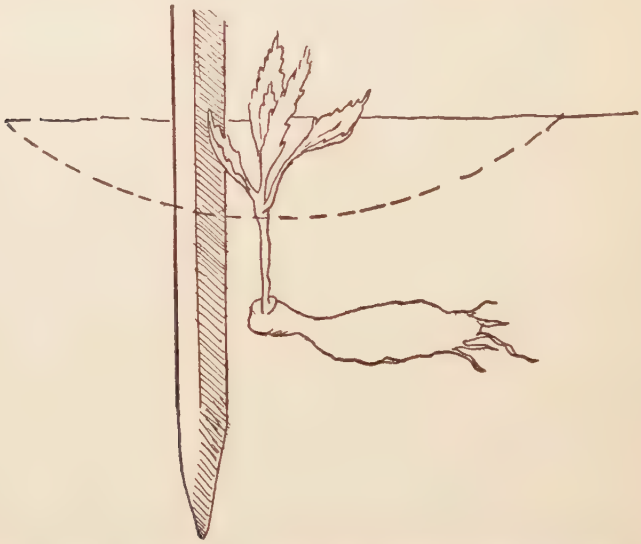
Stakes should be placed no less than three feet apart. Some varieties of dahlias are so spreading in habit that four or five feet are required to give them proper space to develop.

In early spring, when the bare brown earth is so scantily dotted with the stakes, and the tiny green shoots look so frail, it seems incredible that it is necessary to set them out so far apart. One year's experience, however, will teach any one to measure those three feet carefully, adding a few inches just for good measure.

Everywhere in our hot, dry climate dahlias should be planted deep. Dig a hole close to the stake at least eight inches down. Let there be no manure or fertilizer where the tuber is to go, and if it is a delicate one, place a little extra sand at the bottom for drainage. Lay the tuber in a horizontal position; with the eye or shoot facing up and as close to the stake as possible, scattering lightly over it enough soil to cover an inch or two deep. All dahlia tubers in a clump radiate horizontally from the main stalk, and this demand from the tuber at planting time must be complied with or there will be no bush.

If the eye faces downward when planted, the shoot will grow just the same, and Nature tells it to turn around, doubling upward to reach the air. It makes little or no difference in the resulting plant so far as the following summer is concerned, but after digging the clump one readily sees trouble ahead when the time comes to separate the tubers. The stalk has twisted

U-shape; the tubers have started from all parts of it, and the whole resembles the tangled hank of yarn which the unfortunate Princess had been



Tuber planted properly. Dotted line shows depression when first planted; to be levelled later

ordered by the Wicked Stepmother to undo without breaking.

Planting the eye close to the stake makes the training of the stalk much simpler, for it can more easily be tied without straining, and is held more rigidly. The new tubers in growing surround the stake, and thus stake and plant become almost one.

Sometimes tubers have been left lying about for a week or two after dividing, for lack of time to put them in the ground. If they were not protected from the air they will have shrivelled; and the eye, no matter how healthy, will have great difficulty in making growth. Sometimes they will grow a few inches and then stop. Tubers from plants which had grown rapidly the year before are especially liable to shrivel under such circumstances. If there is any question as to their appearance soak them in a pail of cold water for from twenty-four to forty-eight hours. They will not necessarily swell, but the water will get in between the fibres of the tubers, and a fine plant will be the result.

Do not press the soil down upon a tuber. If it is dry pour a little water in to tuck it around the tuber just enough. The warmth of the sun penetrates the shallow covering and starts the tuber into growth. The loose and friable soil allows the young roots to work their way through without great effort, and new tubers form almost at once. As the shoot grows upward more soil may be filled in until the ground is level. Never hill a dahlia plant. If planted seven or eight inches deep the roots keep cool and moist during the summer. Hilling acts as a shed for the water and does more harm than good.

When the little green dahlia plants are set out, the holes must be dug at least eight inches deep, and after knocking the roots from the pots, they should be set as close to the stake as possible. Gently firm the soil around the roots, adding about an inch of earth over the level of the potted soil, and water thoroughly. Trim off any leaves which may touch the ground and gradually fill in as it grows taller, until again the ground is level. This ensures a deep rooting system, one of the secrets of success in dahlia culture.

When the young plants grow to about fifteen inches in height they should be tied loosely to the stakes. At this time the stems are barely the thickness of a pencil and one is tempted to tie the string with the idea of giving the plant support. Unless the plant has grown rapidly and become "leggy," actual *support* at that time is hardly necessary. The string should be tied very loosely about ten inches from the ground, bearing in mind that the slender stalk will sometimes become six or more inches in circumference. The plants are easily reached at this time; and later, when they grow large and are again tied further up, these lower supports hold the main trunk firmly in place. The bushes cannot swing about with the leverage they would otherwise have, and thus the tissues run less

risk of being strained during a high wind. Heavy plants should have the main trunk tied every two feet or less, and every main branch should be supported from the stake. The joints are brittle and gales whip them off readily if they are not tied.

Soft string, such as is used for tomato vines, etc., is most often used for dahlias, but each year I find myself rummaging through the attic in search of old curtains, old clothes, old anything of cotton. These I tear into strips three quarters of an inch wide (more or less, according to the strength of the material), and with them always tie my most valuable dahlias. Such strips can never cut or chafe the stems, and will last at least one season and sometimes two.

Some of the more spreading varieties it may be necessary to stake again. The ordinary commercial stakes will do well enough for this purpose, for they have little weight to bear. They may be set two feet away from the main stalk and the branches fastened at the angle desired for them to grow.

Such staking and tying sound laborious. The commercial grower will tell you to pinch out the centre of the stalk, forcing the plant to form many branches near the ground, thus overcoming the necessity of any stake at all. This method

is all very well if *roots* are wanted. It is also excellent for growing large flowers on short stems. For a generation or more our dahlia shows have become a veritable nightmare by virtue of such blooms, cut with stems but a few inches long and placed in tumblers or even small milk bottles. Rows on rows of the poor martyred blossoms are placed on tables, arranged irrespective of colour and form, and turning what should be a fairyland into an eyesore.

Dahlias are the most beautiful of all flowers and should be treated with respect. If they are wanted as a garden flower let them grow as Nature wants them to grow—tall and stately. If they are wanted as cut flowers to grace my lady's boudoir, can any one wish to see the great dignified blooms humbled to stand in a short-stemmed vase? At an exhibition one cannot wish for a more glorious sight than a vase of any modern variety of dahlias holding their heads aloft on three- and four-foot stems. So let them grow tall and stake them, thereby making your garden a pleasure and your house a joy.

There are two varieties of dahlias which may be improved by pinching back. These are the Pompon and Mignon types and are useful for planting at the front of the dahlia beds. The latter are covered with blooms at all times; and,

The informal freedom of the Duplex has an individual attraction

made into low compact bushes, need not be planted more than eighteen inches apart. The Pompons, in spite of pinching, are always taller than the Mignons—and, planted two feet apart behind the Mignons, make an excellent intermediary between them and the tall ones.

Since the beds have already been prepared with leaf mould and bonemeal, no fertilizer should be added at planting time. If any manure has been dug in to make a sandy soil more compact, greatest care should be exercised not to allow any of it to come in contact with a newly planted tuber or the roots of a young plant. As the little fibres expand they will reach the plant food soon enough.

Some growers mulch their dahlias with strawy manure just before they reach the blooming period. The manure leaches downward with the action of the rain or artificial watering, slowly feeding the roots. The straw shelters the soil and keeps it from drying out. This does fairly well on a light sandy soil, but such mulch should never be allowed close to the main stalk. The wet straw "steams," and suddenly the whole plant droops. Rot has started in the stalk, and nothing can save it after the tissues have been destroyed.

I have found that regular cultivation is mulch

enough when the plants have been deeply rooted, and that intelligent and systematic feeding will produce the finest results.

The bonemeal, having decayed during the winter, is being assimilated by the young roots as they grow. It gives the whole plant vigour and a sturdy constitution. This, with the leaf mould, is all the actual plant food needed in the soil.

However, if we wish specially fine blooms for shows, for home decoration, or a mass of colour for garden effect, the dahlias must be stimulated to do their utmost—they must have a tonic.

In the middle of August—about six weeks before the dahlia shows commence—a small quantity of sheep or hen manure is given to each plant, governed according to its individual need. Hen manure should be used fresh and mixed with a nearly equal amount of sand before applying.

Draw the soil away from the roots, making a basin about four inches deep and fifteen inches across. Into this scatter one half a trowelful of pulverized sheep manure, or double the quantity of hen manure when mixed with sand. Pour very slowly over this a large bucketful of water and allow it to soak. When the water has disappeared, a second bucketful may be poured in; and later the dry soil is replaced in the basin to act as a mulch. The water carries

the fertilizer down where the roots can reach them, and in a fortnight a noticeable difference may be found in the appearance of the plant. New soft growth has started from the main branches; the leaves are a luscious, vivid green, and flower buds soon appear on the terminals.

Sheep manure and hen manure are strong in nitrates, acting as a stimulus only. They produce vigorous growth of stem and foliage, help the blooms achieve great size, and in sweetening the soil through alkaline reaction, add strength to their colour. By hastening the growth of stem before the blooms expand, the fibres are weakened and unable to support the added weight of extra size.

Such vigorous top growth must naturally be at expense of the roots, and if allowed too much such stimulus there will be little or nothing left to carry over winter. Unless the plants show buds it is best to hold back any fertilizer, for otherwise there will be a tendency to go to leaf altogether.

One such dressing is usually sufficient. Here and there may be a backward plant which, though having splendid roots, seems to be developing slowly above ground. Such plants may have with safety a second dose about a fortnight later.

Soot from the chimneys where wood or soft coal has been burned, added at the time the sheep manure is put in—about a handful of this, not more, to each plant—will give brilliancy of colour to the pink, red, or yellow ones. Do not give any to lavender dahlias, for they will turn magenta; or to the white ones, for they will not remain pure white. If you live in a steam-heated house and have no open fireplaces, you must invest in Scotch Soot, which may be bought at a seedsman's shop.

Chemical fertilizers are not to be recommended for dahlias. The ingredients are all too concentrated to come in contact with the roots, and if scattered on the surface to be washed in by rain, the action is too uncertain to give satisfaction. Nitrate of soda is often given in place of the sheep-manure tonic, but in my own experience the results have not been so satisfactory. There is no doubt that it weakens the vitality of the tubers, and the next year's growth is poor and weak.

Fertilizers mixed with the soil serve two purposes. They either add plant food which is immediately assimilated by the roots; or they cause a change in the chemical composition, setting free and making available plant food which is already in the soil.

CHAPTER VIII

CULTIVATING, WATERING, DISBRANCHING, DISBUDDING—DAHLIAS IN TUBS

HOT weather has come. Plants and tubers are all set out, and we must watch the babies with tender care. If a drought has started, each may have a good drink of water—a gallon or two to each plant just once, and a mulch of loose, dry soil afterward.

From then on the hoe or cultivator should be used regularly. Not a weed must be allowed to poke its nose out. All the precious moisture should be conserved down deep where it is needed. Keep the soil loose and friable so that the young roots may push their way in any direction they choose. Use a five-pronged cultivator, and with it, during June and early July, dig deep. After that the tubers begin to swell, and if the fork should damage them the plant is seriously injured—seldom recovering its full strength again. At this time the fork need only go in two or three inches, loosening the soil, to destroy the weeds and mulch the roots. The

cultivator should be used shortly after every rainfall, or Old Sol will draw out all the moisture through the surface crust formed by the beating of the raindrops.

If rain does not come and the plants do not recover after the day's heat, artificial means must be resorted to.

When watering dahlias, water thoroughly. Soak the soil to the depth of a foot at least. If a little watering is done every day the soil where the tubers are growing is left dry, and the roots must climb to the surface to obtain their drink. Such watering is a great labour and does not produce good plants. Further cultivation disturbs these surface roots and may result in serious damage. If the soil is well moistened directly around the tubers, watering need not be repeated for another week or ten days even in the driest weather. Cultivation, of course, should immediately follow each watering.

There are several methods recommended in watering dahlias. I have seen irrigation practised in the East with excellent effect. One of my neighbours plants his dahlias in long rows—sometimes straight and sometimes curved, according to the contour of the beds. He digs a little trench a couple of inches deep close to his row of dahlias—about six inches from the stalks—and

places the end of the hose (no nozzle, mind you!) at one end. The trench is shallower at the near end than at the other, if the ground is level, and is quickly made by scraping along the ground with a pointed spade. The water flows evenly along for half an hour or more, gradually soaking into the soil as it goes; and when enough water has been given, the plants are cultivated. After that the hose is turned upon the plants themselves with a nozzle screwed down to the finest spray, for the leaves must also have their drink and be refreshed.

I fear me mine might be called the lazy man's method, but the result is so satisfactory that I have come to think it is the better way. About three o'clock in the afternoon, when the dahlias are in shade, the hose is brought out and a simple ring sprinkler is attached to it and placed in a central position. With an ordinary force of water, a fine spray is thrown in a radius of twenty-five feet or more. This is left in position—maybe forgotten during the rush of other work—until the gardener goes to his supper. He moves it to another place, and three hours later either he or I will shut it off. Many an evening have I moved it again at eight o'clock, and crept down in the dark to shut off the water just before bedtime!

Next day this is repeated in other parts of the garden while the soil about the roots of the dahlias watered the day before is being cultivated.

This is Nature's way; and Mother Nature knows what is good for her children. By morning the thirsty flowers have drunk their fill and surplus moisture is evaporated enough not to scald when the sun's hot rays touch them. One soaking is usually enough, but if drought continues longer than usual, another such soaking may be necessary a week or ten days later. In our hot New Jersey climate there is no blessed dew to refresh the tired flowers at night, and he who is fortunate enough to possess one of the many systems of "overhead watering" should turn it on for five minutes or so just at dusk. This "overhead" system replaces, of course, the garden hose and sprinkler, but it is an unsightly thing and should only be used where dahlias are grown for cut flowers only.

The second great secret of success with dahlias is—*cultivate often.* Watering is only an incident and should never be resorted to unless absolutely necessary.

Then summer comes at last. Sun and rain have caused the tiny plants to grow apace and almost over night become small trees. Leaf

and branch are rich and green. The stakes are now quite hidden, but—where are the flowers?

If the weather is hot, be thankful that there are no flowers. Up to the middle of August let there be no flowers. If they want to come be heartless and cut off the buds just as soon as they appear. Maybe your neighbour's dahlias are a blaze of colour and he leans across the fence and relates with pride how on June 30th he cut a blossom eight inches across. He looks with scorn upon your green bushes, and as you listen to his tale you feel very humble indeed.

But he who laughs best laughs last. Your neighbour has had a good crop at first, but each week the blossoms open smaller and smaller. September comes, and with cooler weather flowers open more slowly. Leaves and branches grow, but colour becomes less and less; and when he again hangs over your fence, it is with an envious rather than a scornful eye. *Your* garden is a glorious mass of bloom when there is little to see in his, and your dahlias are winning prizes at the shows when he has nothing to send.

There is much to be done before any appear, if perfect blooms are wanted. There must not be too many branches from the main stalk. Eight or ten of these are enough, and the main

branches should not be allowed too many secondary branches at a time.

Study each dahlia plant and watch its habit of growth. The branches always come in pairs, opposite one another. One is usually longer and stronger than the other, and sometimes the smaller is so tiny that it is hardly noticeable. The little ones are only waiting until they are needed, and may remain there for such an emergency. If more than the desired number of branches are found, break off one from each pair, alternating, if possible, to balance the plant. Be sure that they are well supported from the stake, as with the added vigour which the plants may now give them they will grow rapidly and shortly bear enormous flowers. Naturally, the earlier this is done, the better, as just so much more strength and vigour has been conserved for future blossoms.

Just as the stalk should carry a limited number of branches, so also should the secondary branches not be allowed to crowd. These are destined to bear the perfect blossoms which will win laurels at the shows. Some varieties will rebranch at every joint, and if their ambition is not promptly checked, the plant will be but a compact bush without bud or flower.

Break off one from each pair of such shoots—

for these, like the others, come also in pairs. Remember that there should be plenty of ventilation among the leaves, so plan to allow only shoots which will grow outward to remain.

If flower buds form early in the summer the stalk should be cut back at least halfway. No harm done! Two shoots start vigorously from the last joint left, and in due course of time will reward you for your care.

About the middle of August is time enough to let the flowers have their way unless the plant is destined to make a special effort for some show.

The uncertainty of weather is a big factor at this time. With a normal amount of rainfall, moderate heat followed by a few cool days, the average dahlia will produce a magnificent bloom four weeks after the tiny bud is visible. Greater heat and stimulating fertilizers will produce flowers more quickly, while cool dry weather will hold the buds back as long as it lasts. Taking all this into account, I always stop entire disbudding on August 15th, and begin disbudding for bloom at once.

Each flower stalk soon shows three or more terminal flower buds. When they are about the size of peas, all but one should be removed, saving, if possible, the central bud. Any of the buds will develop well, but only the central bud

is certain to make a straight stem. The others are liable to grow outward at the angle at which they had started. Such buds, however, must be used if for any cause the central bud has been blighted. I have been able to train the bud to grow straight by the use of a waxed paper lemonade-straw opened lengthwise put on as a splint, and tied with fine thread. This process, however, is so laborious and so often unsatisfactory that I have given it up, preferring to rely on another blooming stalk.

Before the flower opens there appear at the joints of the stem numerous little shoots, which divert the strength intended for the bloom. Break off each one carefully as soon as they appear, down to, but not including, the last joint next the main branch. They snap off easily next the stem. This last joint should be allowed to remain when the flower is cut, and soon after throws out two new blooming stalks. These may in turn be treated in the same manner as the original.

If left, these little shoots form flower buds and the stem will carry a spray of insignificant blossoms in various stages, rather than the large, dignified, and perfectly formed bloom which is a joy to behold.

This disbudding should be done every day if

Dahlia branch showing crotch bloom already disbudded. Side branches need disbudding

exhibition blooms are wanted—indeed, twice a day is better if one has the time, for during the height of the blooming season the side shoots will appear in two or three hours. The smaller they are when broken or "rubbed" off, the better. So much more strength is saved for size and beauty of the terminal bloom.

Though the plants are exacting, the work is anything but drudgery. It takes but an hour a day, and sometimes less, to go over my 500 plants. Each bud becomes an intimate friend as I watch it develop day by day; and the satisfaction when I cut the perfect bloom, opened to its fullest glory, is the satisfaction of one who has finished a beautiful painting.

One day not long ago some friends motored out from town to see the dahlias. Of course, they found me among them, up a stepladder, disbudding some of the tall ones. When I showed them how it was done they chorused "Oh! let *me* try!"—which they did. I was called to the telephone. Then other visitors came and had to be shown around. I had almost forgotten my first guests for nearly an hour, but when I returned to them, there they were disbudding with all the keen interest of professionals. The thought of Tom Sawyer and the whitewashed fence came to my mind. The work was *fun!*

Some dahlias are low in growth and all parts are easily reached. There are some, however, which seem to possess the blood of Jack's Beanstalk. The English Joffre and Mrs. Lymberry's Ballet Girl, for instance, climb skyward in whatever kind of soil I use. One August morning on a return from a ten-day absence I found Ballet Girl had achieved a height of fifteen feet. Had a storm come at that time she would have whirled completely out of sight. The trunk at a height of five feet was too heavy for my pruning shears and I had to call for man's strength and a heavy knife. We cut her down more than halfway, and by mid-September she had climbed again, and dancing in mid-air were hundreds of fluffy blooms for all the world like little tulle petticoats.

Naturally, disbudding such gigantic plants is more or less an acrobatic feat. Stepladders are dangerous things to set on the soft earth unless planks are placed under the feet. The most convenient step to use for this purpose is a tall wooden box. We cut a slit in the bottom four to six inches long and an inch or so wide—just big enough to slip the fingers in and grasp the box. Two or three such boxes are in among the plants in my garden, always at hand to step upon when needed, and the ladder is only resorted to when absolutely necessary.

At this time we realize the necessity of three or four feet of space. Sometimes it is almost impossible to pass between the plants—and woe to any woman with vanity enough to wear a hairnet!

Disbudding vigorously serves many purposes. It increases the size, of course; but what is far more important, it brings strength to the stem, substance to the petals, and perfection in the flower's form. The beauty of a dahlia is not enhanced by size, except in a very few cases. True, size produces a thrill—just as an amazing circus feat will thrill. I have seen men stand speechless before a twelve-inch bloom of Kalif, marvelling at the size and colour. I have never seen a woman do so, but I have never seen a man or woman in my garden who has not been drawn to a bed of Mme. Annette Reynault as by a magnet. The grace and beauty of that indescribable little blossom never fails to give the greatest pleasure. The French know what is beautiful in flowers, yet seldom are their dahlia creations large.

Some dahlias need to be large to hold their dignity, but no beauty is gained by turning them into monstrosities. This is easily done by throwing the whole strength of the plant into one flower. Take Pierrot and Stredwick's Melody,

for instance. A tall vase of six-inch blooms is more beautiful than a great twelve-inch bloom, so heavy that it cannot hold up its head. Is King of the Autumn more beautiful when twice the size?

The evolution of the modern chrysanthemum shows us what goes on in the minds of flower lovers. A few years ago the 'mum shows were filled with the gigantic blooms at which we always marvelled, but which down deep in our hearts we did not covet—and never *loved.* Now the small-flowering varieties of branching habit predominate. They are human and lovable and appeal to everyone.

So it will be with the dahlia. At present the points in competition at the shows give a large percentage to size, but it will not be long before we in America appreciate that the dahlia as a garden and a cut flower cannot be surpassed; that extra size only tends toward coarseness and insolence in a flower which is really the aristocrat among all others, and where refinement should predominate.

Such disbudding as is here described should be applied to the heavier types of cactus, hybrid cactus, decorative, and some varieties of peony-flowered dahlias. There are others, like the pompon, most singles, and anemone-flowered, the "star" types and some of the smaller cactus

which are just as well left alone. Disbranching these varieties, however, is all the more important, for the flower stalks will crowd if too many branches are left.

Dahlias, like people, sometimes get cranky. They will grow almost out of hand, luscious in leaf and stem, refusing to flower; or they stand still and refuse to grow at all, stolidly remaining the same height all summer. The treatment for both is the same—*cut them back.* In July they may be cut almost to the ground, leaving only a shoot or two to develop. In some cases the tall plant may be pruned out, like a rose, leaving only a few branches, and these severely disbudded. Blooming thereby is not delayed, and if the time is short it is the better way. Such plants, however, are liable to look unsightly in the flower garden as their shape has been destroyed. These tall plants need no further encouragement, but burst into bloom almost at once.

Not so the little one. Many things may have caused his trouble—impoverished soil, sun blight, insect pests, or disease. In any case, however, cut them back. The impoverished soil must be remedied. If the tubers are well formed, nitrates may be added in the form of hen manure or sheep manure, or even nitrate of soda. If quick action is wanted, use manure water. Place

a few spadefuls of manure into a burlap bag, and after tying securely, plunge into a barrel half filled with very hot water. In a few days or a week the liquid may be poured over the roots of the plant. Be sure that the soil is already moist before applying the "tea," and do not be too generous at first—a gallon or so at a time is plenty, and a second drink next week if necessary. If the main stalk is not too "woody," shoots will start promptly from the joints. Allow only a few, and disbud vigorously as they grow.

If they sulk because insect pests have attacked them or they are diseased, Chapter X will tell you what to do.

The treatment of plants destined to be grown in pots varies somewhat from the other. Usually sturdy green plants are used for this purpose, though dahlias which have not made more than three or four inches of growth above ground may be dug up, soaked twenty-four hours in muddy water, and placed in a ten-inch pot—or even larger if possible. Use rich soil, lightened with leaf mould or peat, and stimulate with manure water at blooming time.

The pots should be plunged completely into the ground in the coolest part of the garden, for, as these plants are needed indoors, in the con-

servatory or even on the veranda, after the garden has gone to sleep, they should be grown slowly and the blooming period held back as long as possible. Turn the pot every week or so in order to destroy any feeding roots which have found their way downward through the drainage hole.

Late cuttings can be used for pot-grown plants, but tubers from such cannot be depended upon for winter keeping if the plants are forced to bear many flowers. They do best if the centre stalk is pinched back to two or three joints, allowing a low-branching system, such as large growers use in the fields. This makes a strong, husky plant which can easily be handled when the proper time comes to lift it indoors.

Early in September the plant may be shifted into a butter tub, previously tarred inside for protection against the salted wood. This must be done with great care not to disturb the roots, and the plant must be vigorously watered directly after.

Small stakes and green string, such as are used on Easter plants, will be sufficient support, and enough disbudding done, to perfect the flowers, will make a very handsome house-plant. In this way dahlias may be blooming for you until Christmas time.

CHAPTER IX

FROSTS; LIFTING AND STORING

WITH the month of September comes the realization of our dreams. Phlox, lilies, asters, all are past. The 'mums are only showing little buds and will give no colour for another month.

But the dahlias! They have burst forth in their full glory. They seem to sing an anthem, silent to the ears, but crashing forth a veritable halleluiah chorus in colour, a thanksgiving chant, for very joy of living.

Then we feel that the time has been well spent in the garden. They have given threefold for the little that they demanded of us. Every plant by now is an intimate friend. Every bloom is a personal gift.

Our friends come to see, and we enjoy that pleasure of all pleasures, the sharing of the garden with those not so fortunate as we. Guests never leave my garden without an armful of blooms. No one from my household ever goes to town without a boxful of dahlias for folks

in the hospital, or some other unfortunate city dwellers—and the plants seem to know this and redouble their efforts to give more and more of their wealth of beauty!

As the month wears on and the nights grow cooler, down in our hearts we are thinking of and fearing the dahlias' worst enemy—Jack Frost. When the afternoons are still and clear, and the temperature has been dropping steadily, we have good reason for such fears, and it is well to cut all the blooms possible—even those not fully developed—to be brought into the house.

Provided that the previous day has not been hot or windy or rainy, dahlias will stand a temperature of 32° for two or three nights in succession. In fact, in my garden they have endured without harm a temperature registered at 28°. Heat and wind tire the plants, and when the chill comes they cannot withstand it. If the plants are wet, they will freeze, and thus are done for.

We have built smudge fires with some success, which protect against a light frost. It is not the *warmth* of such a fire that keeps Jack Frost at bay. The smoke rises and forms a sort of umbrella over the plants, protecting against the dew that might otherwise freeze upon them.

Sometimes frost steals upon us unawares, or

sometimes he bites in spite of our precautions. The tops of the plants show drooping leaves and flowers are almost transparent. Spray them at once with the coldest of water and cut off the blooms. If the sun comes out hot this will not help, but if Nature is kind and sends us a cloudy day we will find very little damage done. The lower parts of the plants are safe at any rate, and by cutting away all that is injured, we may have plenty of flowers again.

Such near-tragedies often occur in mid-September, and then weeks may go by without a thought of freezing. When it does come in earnest, however, we must turn our backs upon the garden for two or three days. They are a sorry sight indeed, these poor black things, hanging limply upon the stakes. They must be left there, nevertheless, until the water from the "water-pipe" may go partly back to the roots and give them nourishment for their winter's sleep. In our climate, where warm days following a frost may start the eyes to sprout, which are really destined for next year; or where a cold wet spell may cause the sleeping tubers to decay, it is not safe to let these plants remain more than three or four days.

They must be dug carefully. The tubers have countless fibrous roots running in all directions,

which cling tenaciously to the soil. The slender necks may easily be strained by them and much harm done if care is not exercised.

First cut down the stalk to within an inch or so from the surface of the soil. Pull up the stake slowly and carefully and, removing the label, attach it to the stalk. The safest way to do this is to force the wire through the stalk, fastening like an earring. The drying of the stalk during the winter shrinks it, and a label whose wire is tied around it will easily slip off in handling. When all the stakes and rubbish have been cleared away get two people to do the digging, if you value your roots. Have them stand opposite one another on each side of the plant, and, armed with spading forks, loosen the soil a foot or more away from and around the stalk. Then, simultaneously, they should drive the forks as far down as possible, making certain that the prongs are well under the deeply rooted plants, and both together—heave. Do not shake off any soil from the clump. If soil and roots make a compact mass, all the better, for in handling, the tubers are held rigidly in place and cannot be broken. Tip the clump upside down at once so that all the water may drain out while the next clump is being dug.

Before nightfall bring the clumps under cover

to dry. If the soil around them is clean and healthy it may be allowed to remain, but if of a clayey substance which holds moisture, it should be removed; otherwise decay will surely set in during the winter.

In a few days, or a week, perhaps, the time has come to put them away for their long winter's sleep.

People differ greatly on the best way to keep dahlia roots. During the past twelve years I have taken everyone's advice—tried every method suggested, lost many valuable roots, and come back to my own conclusions.

There are two things essential in the keeping of the roots: In the first place, every root must be *absolutely sound* before it is put away. Examine it carefully, and if a spot of decay is found on any part, that piece must be cut away. Dust the wound with powdered sulphur or slaked lime, and no harm will be done. Every housewife, especially since the war, has learned that the tiniest decayed spot on a vegetable to be canned will decay the whole jarful in short order. So it is with a spotted dahlia root. The spores increase; they travel through whatever covering material is used, come in contact with a neighbouring clump, and destroy it. By the end of winter not only the original clump, but

sometimes every clump in the immediate vicinity, will be dead.

For this reason it is important at digging time to drain the water out of the hollow stem. Any left there has a tendency to start decay in the neck of the plant—the very heart of what is to come next year.

The second important factor in the keeping of roots is a cold, *dry* room—a room where there is no danger of freezing and where no artificial heat can reach it. A temperature of from 40° to 50° Fahrenheit is ideal, and it is important to maintain this temperature during the spring if possible: there is less liability of their sprouting at the time we want to divide them.

There are a number of ways to protect the roots from drying out. If the tubers are plump and the soil has been left upon them, they can merely be stacked in the corner of this cool, dry room, and forgotten. The chances are they will come through all right. Some people use ashes from the furnace or kitchen stove to cover them. This is all right if the soil covers the tubers and protects them from the ashes, but I never advise placing the ashes directly upon the tubers, for the alkaline is liable to be destructive to the tissues.

Many people pack their roots into barrels,

placing them upside down, filling as tight as possible, and stuffing the barrel with newspapers to keep out the air. Plump tubers usually survive the winter so, but all slender tubers must be packed in some material which will completely protect them from the air.

Sawdust is another medium often used. It is cheap and usually easily procured, and under ideal conditions should act as perfect protection. There is, however, an element dangerous to the tubers in the use of sawdust. Nearly all sawdust contains some tannic acid. If in any way it becomes wet while cold, this acid is set free and destroys the tissues of the roots. Sawdust holds moisture a long time, and the slightest moisture originally in the tubers themselves may be taken up and held in the sawdust for many weeks afterward.

A few years ago a large commercial grower of dahlias, whom I count among my very good friends, disclosed to me what was then a "trade secret" on the best way to keep dahlia roots. He had learned this at a meeting of the Florists' Club or the American Society of Florists, or some such association, and all the growers were planning to buy up all the *ground cork* to be found.

I was deeply grateful, and proceeded in search

of ground cork myself. None was to be had in places where cork was usually sold—all the dahlia men had been there before me—so I went to the wholesale markets and bought the kegs containing ground cork in which Malaga grapes had been packed. These I brought home in triumph and packed my dahlia roots carefully in them. Next spring there was not a living root among the lot. So much for ground cork, so far as I am concerned!

After so many trials and failures I began to think for myself. For many years since then I have packed my roots in sand. Losses have seldom been more than one per cent., and I have nearly always discovered a good reason for the loss.

Follow these directions, and if your storage room is cool and dry, and your roots are sound when put away, you will never regret the course:

Examine every clump for decayed spots and for moisture in the stem. Cut off all broken tubers and those whose necks have been strained. Cut away spots and trim off the fibrous roots. If there is any moisture, set the clump to one side until dry, for though sand itself will dry quickly, it will keep moisture from evaporating from the roots, or from the soil which is packed about them. The stalks should not be more

than four or five inches long at most, so it is usually necessary to cut each back before packing. If long stalks are left on the clumps, the necks of the tubers are the more easily strained because of the greater leverage. Never fail when putting on the label to force the wire through the stalk—thus preventing serious mistakes by mixing labels while removing from the sand in the spring.

Buy, borrow, beg, or steal all the deep wooden boxes which you may need. Set them on the floor and line with clean newspaper. Fill the bottom of the boxes with *live* sand, fresh from the pit, to a depth of about three or four inches. Lay the clumps on this as closely as possible to economize space, and fill the whole box with sand, so that the higher tubers are covered to a depth of three or four inches at least. This sand must be fresh and pure. Never use sand which has been lying about the potting shed or which has been used in the vegetable cellar. It is liable to contain the spores of rot or mildew and will destroy the tubers.

Such sand need not be perfectly dry to begin with. In the dry cellar all moisture will evaporate from it immediately. A fortnight or so after packing it will be necessary to run the hand down into the sand and among the tubers,

to make sure that there are no open air spaces where they might dry out. Tuck the sand in among them—it will run easily by that time—and add more sand on top if necessary. Keep the cellar well ventilated and as nearly as possible at an even cold temperature without freezing. Should the sand become exceedingly dry before spring, wet newspapers may be laid upon it, though with the exception of very small tender roots, this is not a necessary precaution.

The little "pot roots" still in their pots may be placed close together on shelves and watered sparingly about once a month. If this is not convenient, they may be placed in boxes after having had a slight watering a few days before, and covered with sand like the other roots. Be careful that the labels are not dislodged from the pots. It is better to keep each variety in a separate box.

During the winter months a chemical change takes place in the dormant roots. They should have a month or two in which to adjust themselves for their new start in the spring. This is particularly important in case the clumps are to be forced for green cuttings.

In some of our Southern states, where at no time during the winter the temperature goes much below freezing, and where the soil is sandy

enough to ensure against rot, many growers report that the roots remain dormant and keep better when left in the ground, to be lifted when ready to divide. A slight mulch is a wise precaution against an unusual cold snap, however, and the hollow stump should be stopped up, to avoid accumulation of water.

Where the ground is heavier, and decay is liable to start through moisture and cold, the roots must be dug and stored. Since the dormant season there lasts but two months, the packing in sand is not so necessary if the material is not easily procured.

Dampness is the feature to combat in the cellar where the climate is warm, and some people find it necessary to pack the roots in gunny-sacks and suspend them from the ceiling.

While the roots are sleeping do not forget to prepare their breakfast. Put the bonemeal into the soil as soon as the roots have been taken out. The soil is loose then and the fertilizer is easily incorporated.

CHAPTER X

PESTS AND REMEDIES

WE ARE always told that there are very few pests which harass the dahlia; yet every treatise on dahlias that I have seen gives the name of a new enemy, every friend I have questioned has spoken of some beast that destroys, and has asked for a suggestion for a remedy.

There are enemies waiting underground to attack the roots as soon as planted. There are beasts who steal from their hiding places at night and cut down the tender shoots. There are mean, slimy, sneaking things which crawl up the young plant and suck the sweet water from the water-pipe, interrupting the flow and damaging the stems. There are horrid, crawly worms who snuggle inside the main stalk and fatten on the pithy lining until suddenly the whole plant drops dead. There are flying creatures both large and small, who sting the tender shoots, or plant their eggs therein, causing them to shrivel and die. When we have battled

The refined gracefulness of the true Cactus type

successfully with them all summer, and at last the plants are in their full glory of bloom, there arrives a true plague of grasshoppers who veritably devour them under our eyes! And then, last of all, when we put them to bed for the winter, there comes a disease to attack the dormant roots which practically ends their usefulness.

No, there are plenty of enemies to the dahlia; but fortunately few people have more than two or three of them to attend to. In one locality, that two or three may be quite a different collection from that endured by another garden a few miles away. This may be partly due to climate, but more often to soil or neighbouring plant life. In a garden like mine, for instance, surrounded by the wilderness of virgin forest, the enemies which I must fight are quite different from those which a friend must look for who lives in a community of carefully cultivated gardens.

We might divide the enemies into three classes—four-legged, six-legged, and those who have no legs at all. I confess there are some two-legged animals who come to my garden when I am not there, and carry off my best blooms—my method of combating them is to invite them to come by day when I am there, that I may have

the pleasure of cutting the flowers myself and presenting them with a bouquet!

Of the four-legged there are but two—rabbits and moles. Rabbits are easily dispensed with by a shotgun—or Paris green on lettuce leaves spread appetizingly about, just in time for supper. The shotgun would be the surer method, if we can persuade the local game warden that the rabbit was damaging the crops. (By the way, rabbits in early spring are excellent fertilizers for grapevines and climbing roses!)

But moles often become a serious menace where dahlias are to be grown.

Fortunately our Government is wise enough to consider moles as vermin, allowing us to kill them by whatever means we wish. In a few European countries, moles are considered beneficial to the farmer, as they devour the pupa of all pestiferous insects, and seldom if ever eat of the roots of crops. That is all very well in Germany. I have often wished the moles that visit my garden were in Germany. I do not want them in my dahlia beds and I am sure that my readers do not want them in theirs.

Moles usually make their permanent runs in early spring. If the run is damaged by forking the garden, they come back and repair it. These runs usually lead to the nest, quite far

below the reach of the spading fork, and when the baby moles are able to leave the nest, Papa Mole and Mamma Mole take them out and give them a first-hand lesson in heaving the soil. They make little branch galleries from the main runs and seem to rejoice in passing under a newly planted tuber, giving it an extra heave.

Perhaps the tuber has grown a nice shoot six or eight inches high. The ground all about it is soft and we cannot see that a mole has been working there until suddenly the tender little plant drops dead. On putting the hand into the soil around the tuber, we find a large hole under it. All the rain water has run away through that hole, and the air in the hole has dried the tuber beyond repair. This will often happen in mid-summer as well, even with large plants having good-sized roots. The spring runs of the moles are abandoned after a while and mice, shrews, and ground squirrels use them, devouring the roots as they find them.

There are several methods of poisoning moles, and many people have had success with them. Poisoned grains may now be purchased, and are far easier to handle than the home-made variety. Generally directions are given with the package. I always use a small stick to make a tiny hole in the roof of the run every few feet, dropping

a few of the grains in and carefully covering the hole with a lump of soil, a small stone, or a bit of sod. Moles, being blind, have their other senses more acute and can immediately tell if there is a hole in the roof of the run by the fresh air which comes in that way. This makes them cautious, and the poisoned grain may not be considered a safe diet that day.

There are a number of gases used in the runs to kill moles, but there is much labour entailed in the finding of all openings (which of course must be tightly sealed), and unless the run leads to a nest, there is little chance of the gas reaching the intended victim.

Intelligent trapping with me has been the most successful method. Moles hibernate very far underground, and after their long winter's sleep they are hungry. In early spring they run close under the surface of the soil in search of insects and pupæ, and are not so wary of possible dangers as they are later in the season. If the trap is set as soon as a new run is discovered, the chances are that Mr. Mole will be in it before sundown.

The ordinary mole trap is made of strong steel. A plate containing long spikes is attached to a powerful spring which drives it down as soon as the mole works under a second plate set over

the run—this plate being held in place by a very sensitive lever, easily dislodged by the disturbance of the earth below. In setting the trap, tramp the run down lightly for about two feet, and test the trap where it is set to see that no stones interfere with the teeth. Under no circumstances touch the trap or the soil with the hands, for the mole has a more sensitive nose than we give him credit for. He quickly suspects foul play and will work around outside the trap. This will more often be so after he has had a square meal.

Rid the dahlia beds of moles in the early spring, and there are few chances that you will have trouble with them again. Keep an eye open for them at all times, however. If you see one working and heaving the soil, step quickly upon either side of him so that he cannot escape, and dig him out with a stick. Blind as they are, they can run like the mischief, and it takes quick action to get one. They can bite, too, and the sooner he is put an end to, the better. The most merciful way is to hold him securely by the tail, and with stick or trowel give him a light blow on the nose. This ruptures a blood vessel and he is instantly killed.

With the enemies which have no legs, such as snails, we might as well include the cutworm

and borer (though they have a means of propelling closely resembling legs), and slugs of various insects who have so many that we cannot count them.

The usual method of combating them is by the use of barriers to keep them from reaching the plants. Snails are usually kept off by using a square of building paper about six inches each way. Cut a cross slit in the centre to be bent and fitted around the stalk, and one slit cut through from the centre to the edge. Open this paper and place it around the stalk, as far down as is practical, bending the points downward, adjusting it to make a shield, thus preventing them from climbing any farther. If the plants are young, a little circular ridge of coal ashes may be placed around them, about six inches away from the stalk. This the snails cannot climb, nor the slugs burrow.

Slugs may be trapped by placing boards or flat stones all about the plants, and each day harvesting the crop.

Cutworms are an abomination not to be endured in the garden. Their depredations play havoc for a while during the month of May and the early part of June. They come out of their holes at night, crawl over to their victim, stand on their tails and, with great precision, cut the

stalk off just one inch from the ground. After feeding upon the sweet fresh juices of the plant, they snuggle down into the soil close by—only just under the surface—and sleep and grow fat, until the following night, when they repeat their operations. They are easily found when the ground is stirred near the injured plant, all curled up tight and too lazy to move—of light gray colour with yellow head. Kill every one you meet if you value your dahlias.

Cutworms are easily kept away by a "collar" of building paper. Cut a strip three or four inches wide and about ten inches long. Pin the two ends together, making a collar about three and one half inches in diameter. Place this around the young plant when first set out, or as soon as it has started up from the tuber, forcing it about an inch and a half into the ground. No cutworm can burrow more than an inch below the surface of the soil, and as he cannot crawl up on any object he is unable to get over the barrier.

If the garden soil is much infested with cutworms, with slugs, or pupæ of any destructive insect, there is a very efficient remedy which can be used with definite result, ridding it of all such things and at the same time when used in very large quantities killing weeds and seeds of

weeds which may be there. This remedy is also most valuable in the vegetable garden and in soil destined for hot beds and greenhouses.

With a strong crow bar force a hole into the bed about twelve inches deep. Pour into it one tablespoonful of carbon bi-sulphide and close the hole immediately. Repeat these holes every eighteen or twenty inches in every direction, but never nearer than two and a half feet from a shrub or growing plant. Their roots, spreading some two feet, might be injured by the treatment. This chemical instantly forms a gas which percolates throughout the soil and *kills all animal life.* It also seems to have a tendency to liberate certain ingredients in the soil, thus adding to its fertility.

If you are a man and inclined to smoke a meditative pipe while doing garden chores please have courage enough to desist during this operation, else—Bang! and that will be the end of the story!

In a few hours the gas will have entirely passed off, and next day it is quite safe to plant the garden, feeling sure that no cutworms will disturb them this year at least. Carbon bi-sulphide may be purchased from any chemist for fifty cents per pound. It is a liquid which, like ether, evaporates quickly. The pound seems to

be the proverbial pint and is sufficient to treat thirty-two holes—enough to protect fourteen dahlia plants set in a double row.

Another legless enemy is the stem-borer, of whose presence we can never be aware until suddenly the top of a well-grown dahlia plant droops and dies. On examining the stalk, it is easy to find a tiny hole which he has pierced in order to enter. Cutting down the dead part of the bush we find him in the hollow stalk; two inches long and as plump as your little finger, having fattened deliberately upon the inner lining of the "water-pipe." The dahlia plant may sometimes be saved without cutting back if the damage is discovered before it has gone too far. Make a slit in the stalk just *below* the hole —for he is quick to know that you are after him, and will drop to the bottom of the section he inhabits as soon as the plant is disturbed—and fish him out with a wire. The slit may be tied together with a bit of soft string around the stem, and usually heals in a day or two, when the string should be removed.

Another excellent method of treating borers is to puncture a small round hole at the *top* of the section inhabited by the borer, and with a medicine dropper flood the section with a weak solution of arsenate of lead—about half the

strength for sprays. The corpse of the borer seems to act as a fertilizer!

Be sure to give abundant water to the roots of the plant for a day or two, if it is not cut back, in order that it may more easily recover. If much does have to be cut away, the plant puts out new shoots with great speed.

The six-legged enemies are divided into two classes—those which suck the juice, and those which chew. The insecticides employed against the latter are to poison the leaf which they chew, the poison being taken into their systems with their food and killing them. Arsenate of lead is the best for this purpose as, although it spots the foliage by reason of its own whitish colour, it does not injure them. The sucking insects are not so easy to handle, especially on dahlias. They must be killed by a chemical which penetrates through their skins. Any irritant which is strong will kill the dahlia as well as the insects.

Among the six-legged enemies are the aphids; green, black, and white fly, who begin early in the summer, as soon as the plants put out their tender shoots, and continue their depredations until frost. They may be grouped under the one name, plant lice, and Huxley, whose word has never been questioned, stated that the uninterrupted breeding of ten generations from a

single ancestor would produce a mass of organic matter equal to the bulk of five hundred million human beings! All this bulk comes from plant life and their taste goes strongly to that which is cultivated rather than that which is wild. Fortunately for us we have birds who devour them by the thousands and little red lady-bugs and their tiny violet-tinted cousins, whose diet consists almost wholly of aphis, and who are in turn eaten by the birds.

Early in the spring an egg planted on a fruit tree hatches out a little lady aphid without wings. In a few days this first mother brings forth living young, also females, and continues, as long as she lives, to add two to eight females daily—nearly all summer. There are no husbands to boss or brothers to bother, and all these females continue the same process without hesitation. The third generation proceeds to develop wings, and by common impulse flies direct to the tender shoots of any especially valuable plant. Again they produce wingless female young as rapidly as their great-grandmother, and the tender shoots are quickly covered with aphids who daily also produce more.

Possessing sharp beaks, which they force into the tender stem, they spend their lives pumping

the juice into their bodies. Every now and then they raise their hind legs and discharge a sweet syrup of which ants are very fond. Ant hills are always found near a colony of aphids. Late in the summer the last generation of females develop wings once more, and fly back to the fruit tree whence their ancestors came. Then comes a generation exclusively of husbands and fathers who shortly perish, leaving the women folks to hibernate and begin operations next spring.

We cannot afford to leave the work of destruction of aphids entirely to the birds and lady bugs. A mild solution of nicotine-sulphate is a good remedy. (Black Leaf 40 added to whale oil soap solution is as effective as any.) Usually a solution a little more than half the strength of that used on roses suffices to kill the lice on dahlias. The tender, soft growth cannot stand the irritation caused by tobacco when very strong. The three aphids vary in their habits only a little, but the treatment is about the same. In the case of young plants, if only a few shoots are slightly affected, the aphids can be wiped off or the shoots cut off and burned.

White flies appear late in June or early July, when hot weather first begins, and can be

noticed only in the winged stage, which keeps up intermittently for a couple of months. White flies hide under the leaves and in the joints of the shoots, flying about aimlessly when disturbed. They bite and suck the juices of the tender stems though not so incessantly as do the black or green aphids. They are particularly fond of the flower bud in its tenderest stage, and it is these little wretches we may thank for our one-sided or malformed blossoms. They are the most difficult type to combat, especially as tobacco solution is only *a cure and not a prevention*. By this I mean that, to take effect, tobacco must be sprayed direct upon the bodies of the insects to be killed. It will not drive away those which did not happen to be killed. It irritates the skin and closes their breathing pores, and they dry up where they happen to be.

Often confused with the white fly, and for some reason, usually associating with it, is the tiny green or white leaf-hopper. In its final winged state it very closely resembles it, and plants its eggs in the mid-ribs and veins of the dahlia leaves. This halts the circulation of sap within the leaf, causing it to turn yellow and curl at the edges. Surely every one who has grown dahlias will recognize this trouble. The "nymphs," or newly hatched babies, are always to be found

under the leaves, close to these mid-ribs. They possess sharp beaks like the flies, and suck the juice also from the mid-rib, causing as much, if not more, damage than the white fly.

From the Wisconsin Experiment Station comes the news that these little fellows not only cause trouble by sucking the juice, but that they are liable to impregnate the plant with a disease. In dahlias it is carried over from year to year in the tuber. This disease is commonly called Mosaic, and is so resistant to remedies that most people recommend total destruction of the whole plant.

Bordeaux mixture and nicotine sulphate control the pest. The plants should be sprayed four or five times during the summer; the first spray to be applied about the middle of June. The following sprays should be applied at periods of ten days or a fortnight, and, if frequent rains occur, repeated immediately.

Mix your Bordeaux according to the directions on the container in which it comes (or if you choose, 4 pounds copper sulphate and 4 pounds unslaked lime to 50 gallons water). Mix your nicotine with it—6 fluid ounces to the 50 gallons Bordeaux—and spray with the finest mist *under* the leaves. It *must* be under the leaves and it *may* be everywhere else!

This kills the hoppers and prevents further depredations. The treatment of the disease itself will be found later in this chapter.

A red spider and a green spider will sometimes attack dahlias in hot, dry weather, but they are easily done away with by a forcible spray from the hose. This should be thoroughly done a few days in succession to kill any eggs which might hatch out in the interim.

Red ants are sometimes a nuisance also, though they only do any material damage in some localities. They are always to be found where the soil is exceptionally rich. Where the nests are not too near a dahlia plant, they can be destroyed by pouring a bit of boiling water into the entrance. This will kill the queen and most of the colony. Should ants persist, they may be poisoned.

Late some afternoon scatter about among the nests a small quantity of very finely ground meat. The ants will devour it greedily and by next morning it will be gone. The following afternoon, spread about the same quantity of finely ground meat, but this time well mixed with Paris green. Next day there will not be an ant in the vicinity.

Now we come to the Buffalo Tree-hopper with his horns and hump back. He both sucks

and chews, though the chewing is so slight that the use of arsenate of lead has little value. His back is so hard that it is impossible to penetrate it with nicotine, and there is little left that we may do but hand picking. He coquettes around the back of the stem when he sees you, and is hard to find, but it is your face he is watching, not your hand. Hold a pot of kerosene and with a quick motion of the hand from behind knock him in. Handle him with gloves, however. He has a pair of horns with a vicious prick to leave the fingers sore for several hours after.

Late in the summer there are times when we suddenly find a young leaf or two high up near a blossom turned brown and crisp, or the stem of a bud grown limp and black. Shake the bush and there arises a perfume whereby we quickly recognize the "Stink Bug" of unholy fame. A large brown beast he is, from one half to one inch in length, cousin to a pole-cat maybe, and so sure of protection by his evil smell that he scarcely bothers to move at your approach.

Touch him not with the hands or his memory will lurk with you for some time. My weapon is a pair of pointed scissors with which he is quickly snipped in two. He may also be dropped into the kerosene can if you run across him when on a "Buffalo Hunt."

The striped cucumber beetle and his various relatives are easily dispensed with by the use of arsenate of lead. Every package of this arsenate has the formula and directions for use printed clearly on the box. The paste or syrup has been my favourite to use as it dissolves more quickly than the powder. In all cases where dahlias are concerned it is safest to err on the side of a weaker solution. It spots and disfigures the plants and should not be used unless they are overrun by beetles.

Grasshoppers seem to wait until the finest blooms are out before they come in any great numbers. Then they pick out the delicately tinted ones and devour!

There seems to be no real remedy suggested for them, except hand picking and clean cultivation around the dahlia beds. Let there be no tall grass near by for them to breed in.

I have had very good luck with two sprays recommended for rose chafer, and if any one has the time for and the price of these expensive luxuries, they are well worth a trial when there are grasshoppers in large numbers. The flowers are not injured by the spray, and certainly with me the hoppers disappeared.

Mildew attacks the leaves sometimes and is generally due to a poor location without suffi-

cient circulation of air and too rich soil. Dahlias must have fresh air at all times. If not, they "damp off" when young, or mildew when older. Occasionally, when a long spell of cold, damp weather comes, when books in the bookcases and even shoes in the cupboards grow white and furry, we may well expect mould on the dahlias. Powdered sulphur is the best remedy. Dust it on when the leaves are damp so that it will stick. Cut out the blackened leaves and shoots, and when the sun comes out again new growth will soon appear to replace them.

Tubers of dahlias are subject to a mild form of scab, somewhat resembling potato scab. While quite dormant it is safe to soak them for two hours in a weak solution of formaldehyde—one fluid ounce of formaldehyde to two gallons of water. Dry them off before planting.

Mosaic, another disease, attacks the roots, and many remedies have been tried without avail. Usually the tuber has a normal appearance when planted, but the growth is slow and stunted and imperfect flowers develop if any at all. This disease is carried over in the root from year to year, but it never affects another root if planted in the same spot where a diseased dahlia had grown the year before. Lately the use of bichloride of mercury solution,

1 to 1,000, has been tried with some success though the result is still doubtful. A newer remedy is Bordeaux mixture both sprayed on the leaves and poured into the ground. If the disease is discovered early enough, cut the stalk down to the ground and dig into the soil a handful of powdered sulphur. When a new shoot appears, mix into three gallons of water one teacup of Bordeaux mixture, and water the ground and the young shoot thoroughly. This quantity seems appallingly strong, but by using as soon as the young stalk appears above ground, it has proved to be perfectly successful in checking the disease in several cases during the past summer. Unless the variety is exceptionally rare, however, it is far better to burn the diseased clump and buy a healthy tuber next year.

Sometimes a tuber which is not diseased will show symptoms much the same when starting into growth. It will begin in a normal way, but when six or eight inches high it will stop growing. The fibre becomes woody and the leaves thicken but do not enlarge. This is usually caused by the fact that the tuber was too dry when first planted.

Dig up the plant promptly, and cut the shoot back to one joint. If the tuber is of fairly good size cut it down and examine it for any spots of

decay. Cut out any such spots and dust either with powdered sulphur or slaked lime, or apply a solution of bichloride 1 part to 1,000 parts of water. Any druggist can prepare this solution, and as it is an excellent cure for rot in iris as well, it is a good thing to have on hand in the tool shed. (Be sure to mark your bottle "Poison." In these Prohibition days anything in a bottle may be interesting to a stranger!) Then soak the root in a pail of water for two days and replant in a sandy soil enriched with peat or leaf mould. Keep the ground moist for a week and the shoot will start up like magic.

Sometimes this trouble may be caused by the bud or eye being wedged so tightly either between two tubers or between the tuber and the old stalk that it cannot start new roots from the base of the shoot as it grows. It lives as long as it can on the old tuber, which sometimes even prolongs its life by enlarging its size. New tubers cannot form, and if the plant survives, when dug at the end of the season only the original tuber may be found. Always have this in mind when planting a tuber, cutting away any bit of stalk or superfluous tuber which might interfere with the formation of new ones.

There is a beast which troubles not the dahlia,

though, lurking among its foliage by the thousand, they wait the coming of the innocent human and descend upon him in hordes. They bite; they sting; they torment with their song.

Perhaps just for revenge humans have named them *Culex pungens* or *Anopheles quadrimaculata;* but that does not help us, and I have no remedy to offer for the mosquito.

CHAPTER XI

CUTTING, PACKING, SHIPPING

MUVVER, see what a nice present I have brought you!" and the Ray of Sunshine danced into the room bearing in his hot, chubby little hands the remnants of what had once been blooms from some of my finest dahlias. Jerked off the bush, with short ragged stems at the hottest hour of the morning, they were wilted almost past recognition; yet the lovelight in the eyes of the child, and the happiness expressed there because he could share the beautiful blossoms with someone whom he loved, checked the first impulse on my part to mourn over the poor dead things.

So with great elaboration we prepared vases and bowls of fresh water, found some soft foliage, and arranged the corpses to look as well as possible. (I felt a little like an undertaker arranging for the last rites!) When all the work was finished, a little gray cloud passed over the face of Sunshine. His mouth pursed

up. "They don't look so very nice, after all, Muvver. Why?"

It is the human impulse to gather flowers and to share them with others. No child is normal unless he has done it; and it is only left for us to show him with kindness and tact just how to do it so that the flowers themselves do not suffer.

Travelling in to town we see the "city folks" bearing tightly in their hands bouquets of little ball-shaped dahlias on three-inch stems. They have spent the week-end with Cousin Kate, and Cousin Kate's garden is resplendent in its September glory. The dahlias there are the same that Aunt Prudence, Cousin Kate's mother, had grown fifty years ago, and the roots have been carefully stored in the potato cellar each winter. Somehow the blossoms are not as large or as fine in colour as in Aunt Prudence's day, but then Cousin Kate has to look after the chickens and do all the housework for the family, and she has not so much time to tend flowers as her mother had. Moreover, her husband needs all the manure for the cornfield and so the flower garden must do as best it can without. But the little dahlias look beautiful to city eyes and they are going to receive all the best attention due them in return for the cheer

which they will radiate throughout the stuffy little flat on the East Side.

Carrying an armful of blossoms in to town we are met by a chorus of kiddies, "Oh! Lady, give me a flower!" and almost before their intended destination, the hospital, is reached, the blossoms are gone. I, for one, have learned to carry the hospital flowers in a box, and an armful for the kiddies as good measure!

Most of these kiddies have parents who still remember their sunny Italy, and tears dim their tired eyes when the little ones carry home these strange bright flowers. They have probably never seen dahlias before, but their colours bring up recollections of the old cottage on the hillside smothered in bloom. They hurry to find an old tomato can and place the stems in water with loving care, forgetting for a time the sordid brick and mortar where they have now chosen to end their days.

Each week a burden of bloom is carried to hospitals, where our boys from overseas, still broken in health, are making so brave a struggle to get well. Better for them than medicine is this tonic of colour and cheer. Just one glimpse at their faces when they catch sight of the dahlias will tell you this, and your blossoms will go to them as regularly as do mine.

Flowers for the hospitals, flowers for your friends, flowers for the shows, all must be cut and cared for with intelligence, so that they will keep fresh as long as possible. This is particularly so with dahlias.

There are three things to know when gathering dahlias: the right time to cut, the right way to cut, and how to handle them immediately afterward. Yet none of these things is of avail if the dahlia plants have been forced and are without constitution. Time and again have I been asked why dahlias wilt almost immediately after being cut, even though my directions have been carefully followed. Examination of the plants invariably shows improper cultivation. The soil is too rich in nitrates, perhaps. Sometimes they have been too vigorously watered, or possibly the soil has not been kept loose and friable enough, and the plant has had a hard struggle to grow.

If dahlias have been planted and cultivated as I have described, and grown slowly, yet without check, the blooms, if cut and cared for as I shall explain, will last at an average of a week or ten days.

The cool of the morning is the best time to cut dahlias (this is not so very early by daylight-saving time in September!). The dew should be

on them still and the sun's hot rays should not have touched them. Have a bucket of clean, freshly drawn water at hand. Cut the stems as long as possible; pull off the lower leaves so that none may go into the water, and plunge the stems into it immediately. Large dahlias should be cut with stems never less than eighteen inches long, and would look better if they were four feet. The singles and pompons should have stems proportionate. One day I unconsciously found myself, when arranging dahlias in their vases, calculating the stems at three and a half times the diameter of the bloom—which happens to be its own circumference also!

Bring the dahlias into a cool dark room for a few hours, to recover from the shock, and they may then be arranged for the house decoration, or for packing and shipping. The open-centred ones droop more quickly than those which are full petalled. The singles last only a few days, as a rule, and the collerettes but a day longer. Peony dahlias with strong stems seem to hold their petals longer than the graceful ones with flexible stems. The varieties with upright habit of growth, such as Insulinde, Princess Pat, Ballon, and J. Harrison Dick, seem to last longer both on the plant and in water than any of the others.

Ball or show dahlias of great size have not the keeping qualities that the decoratives have. To open to their fullest capacity, they must remain on the plants much longer than the others; therefore the back petals begin to dry at the edges almost before their opening is complete.

Nearly all dahlias, under average weather conditions, take about a week to open to their fullest glory. Some will fully open in a day or two, but the bloom grows in size after that, needing two, three, and sometimes four more days. The singles and the collerettes take less time for this and, as I have already stated, the ball-shaped take more. One must judge the best time to cut some of the varieties, as certain reds will burn in the hot sun, and many lavenders bleach at the centre. It is better to cut these a bit early, opening them in the house, although they will never grow to as great a size this way. Blooms from dahlia plants which have been struggling to open in dry weather and have had much water given them last only a short time. They seem to be tired out. On the other hand, blooms which have opened in cool and cloudy weather have the finest colour and last longer than under any other condition. Blooms which have been tossed and whipped by the wind will hardly last a day after cutting.

An excellent recipe has been given me by a gardener friend for adding to the water in the vases:

Into a one quart bottle put:

1 tablespoon salt.

1 tablespoon refined bicarbonate of soda.

1 tablespoon household ammonia.

Fill with pure water—shake well until fully dissolved. Add about a tablespoon of this mixture into each pint-size vase of water before putting in the dahlia stems. Dahlia stems when put into water have a tendency to decay, creating an acid condition. This, in turn, is absorbed by the stems, injuring the bloom. The alkaline solution counteracts this, and the salt strengthens.

Water should be changed every day, and fresh alkaline may be added if necessary. Be sure that the stems have plenty of room in the vases, and plenty of water to drink. The evaporation from both leaves and flowers is very great, and much is taken up by the stem every day. Never place the stem of a dahlia into so narrow a vase that it will be pressed against the side at any point whatever. I have seen a bloom droop ten minutes after being so treated.

If newly cut flowers have a tendency to wilt in spite of these precautions, the old-fashioned

remedy of plunging into hot water may be resorted to. Use water as hot as the hand can possibly bear, and put the stems into it as far as they will go without touching the leaves. Leave them about ten minutes and place them at once into very cold water. The hot water merely opens the pores of the stalks so that they can immediately absorb the fresh cold water given them afterward. A little stimulant in this cold water helps a lot. I have sometimes added a pinch of nitrate of soda with good results and recently experimenting with strychnine, one grain to a half gallon of water, as recommended for peonies and roses, I have found that also to be successful in reviving dahlias.

Blooms which have wilted and been revived are not fit to be shipped. They do well enough at home, and with careful tending will last many days in water. They are like convalescent people; after further hardships they will not survive.

Use only strong, vigorous blooms for shipping. Those which have not developed to their full size will stand the journey better. The full-petalled decoratives travel better than the open-centred. The show and cactus types are the most difficult to pack.

All sorts of boxes are made for shipping flowers, but those made of strong brown card-

board, reënforced with the same material corrugated, are light and strong and stand the wear and tear of travel. They come in collapsible form and can be stored in small space when not in use. The best size and shape is four feet long, twelve inches wide, and ten inches high—allowing large-flowered, long-stemmed varieties plenty of room.

When packed, the dahlia blooms should be perfectly dry, or they will become heated and decay en route. The stems should be kept moist so that no evaporation comes from the reservoir within. I know a dahlia grower who always sears the tip of the stem before shipping so that it will not "bleed." If you have the time and the blooms are valuable, wrap each stem in cotton batting or cotton cloth soaked in water. Tie a bit of waxed paper over this and the stem will be able to have a drink of water on the way.

Line the box completely with waxed paper and lay the largest blooms with longest stems on the bottom. Cover each bloom with waxed paper, protecting it from rubbing its neighbour. When the bottom layer of flowers is in place, with a large sail needle and soft white cotton string, sew the stems to the cardboard bottom. Be sure to place a few folds of waxed paper next

the stem if any sewing is done at the neck of the bloom, sewing right through the paper to hold it in place. This saves the stem from being cut by the string.

Place shorter stemmed blossoms nearer the centre of the box, over the stems of the bottom layer, protecting first with waxed paper laid between. Tie these down also with string and needle if necessary, and then fill the box with the blossoms having still shorter stems. Use plenty of waxed paper to avoid chafing of blossoms and stems and pack the box *tight* before closing. These cardboard boxes need not be wrapped, of course, but mark them in large red letters "PERISHABLE" and "FRAGILE" before trusting them to the tender mercies of the transportation companies.

CHAPTER XII

DAHLIA SHOWS

WITH the coming of September, its shorter days and chilly nights; with the mass of blooms in the garden and thoughts of the dahlia shows now drawing near, there comes over the gardener a tense excitement like that of a horse about to run a race.

The schedules arrive and we pore over them, trying mentally to fit what we have into the classes provided. "Is Hortulanus Fiet pink enough to go into the pink class?" you ask yourself. (Not if someone else puts in Délice—no other pink dahlia has a chance with Délice.) Then you begin to worry because the red class calls for six blooms of one variety, and you have only five good blooms of Kalif on your three plants, and one bud which does not look as if it will open in time. There is a class for twelve cactus dahlias in three varieties, and you are not sure whether you should have four of each kind or just put in twelve—maybe six of one variety and three each of the other two. In

The dainty primness of the Miniature Pompon

thinking over ideas for an artistic arrangement of dahlias you wish that you knew who the judges are to be so as to arrange the flowers to their taste!

Well, you will make your entries, anyway, and trust to luck that you may be able to bring *some* flowers, at least! So you fill in the blanks and post them with trembling fingers.

When the great day arrives and you start to gather the flowers, you are amazed at the number you have. Crystal seemed to have opened on purpose for that artistic arrangement you had planned (after you learned that ladies were to judge that class—you had vowed to use Mina Burgle if it was to be men!)

The extra bud of Kalif had opened wide and the other five blooms were holding their own in form and colour. You have four each of the three varieties of cactus dahlias, which in your heart you knew all the time was much more liable to win against six of one and three each of the other two. Of course it was a pity that some of the varieties failed so that one or two of the classes had to be left out, but you have so many blooms, anyway, you wonder how you will get them all to the show.

When you finally do reach there you think that bedlam has been turned loose. Everyone is

running about asking questions which no one seems to be able to answer. Someone cannot find vases. Where is the water? Somebody else's flowers have not yet arrived—and what *can* be done about it? Another has staged all his entries in the wrong places and forgotten to put up his cards. It is not until long after the hour set for judging that the hall at last is cleared, the débris swept up, and we wait with bated breath for the result.

Let every local community have a dahlia show this year. There is no one flower so well adapted for this purpose than a dahlia. Because of its wide range of colour and form, it is like a hundred kinds, yet in scoring points they may compete justly with one another.

The latter part of September is the best time in our Eastern States, while on the Pacific Coast they are held throughout the whole month and until mid-October.

The show of the American Dahlia Society is always held the last week in September—a time when Southern dahlias are still blooming and Northern dahlias are just at their prime. Plan the local show so that the dates will not conflict; so that you may see all the new varieties there and choose your prize winners for next year.

The hall where such a show is held should be in some central location and not far from the railway station. Exhibitors can reach it more easily, and visitors will appreciate the convenience. There should be no heat turned on in a hall where dahlias are to be shown. No matter how cold and uncomfortable the guests may be, the dahlias are first in consideration.

The lighting of the show is of primary importance. No flower can look well with its back to the light, nor can the judges see to do their work properly. As the afternoon darkens and artificial light is resorted to, see that it is from above and in front of the flowers, yet high enough not to glare.

Equally important to lighting is the proper background for the flowers. The frame for the picture must be made to show the picture to best advantage. Bare blank walls, unpainted tables, or those covered with clean but hideously unsympathetic brown paper can never become a flower. Dark walls and tables decked with burlap of Nature's green will make each flower stand out with its own individuality.

The average table is too low to show dahlias properly, unless the exhibitor chooses to reduce his beautiful flowers to that miserable ignominy resorted to in the old show days, when they

chopped off their heads and stuck their necks in cream bottles set in rows. No man or woman who appreciates the beauty and dignity of a dahlia will show them other than on the long stems which God gave them.

The most effective way of arranging the exhibits is on two-tier frames, the lower front shelf being about four feet high and the rear shelf a foot higher, each shelf about eighteen inches wide, able to hold two rows of vases. The taller vase of each row, being behind, thus arranges the blooms in four tiers, each showing just above the other. These shelves are merely two boards each of rough lumber laid on horses, which can be folded up and stored in small space when not in use. Cover them with dull-green burlap cut to fit. The covers can also be marked and folded away with the boards.

As all this can be used year after year, the first cost is the only expense entailed.

In most amateur shows, or shows held in smaller communities, the exhibitor supplies his own vases. If, however, the show committee supplies them, they can also be stored with the lumber and burlap. They should be tall and slender, of two heights, eight and twelve inches; purchased wholesale, they cost five cents a piece —no more than the hideous milk bottle.

Each community has its own conditions which must govern the arrangement of classes for competition. One condition, however, exists in every place, and should be carefully provided for: there is always someone who has many more dahlias than any one else, and who possibly can afford to pay for more labour on the place and so gets better results. There are always lots of "little gardeners" who feel that they have no chance against such a person, and who are afraid to go into the game. These people love the dahlia just as much, usually spending more time and giving more personal attention to their gardens; and it is they who should be encouraged.

Arrange the classes so that these people have an opportunity. There are many ways of doing this, but I am giving below a list of the classes arranged by the Short Hills Garden Club for its Exhibit in 1920:

First, second, and third prizes for each class in every section.

SECTION I

Class 1. Cactus Dahlias. Any colour. 3 blooms, 1 variety.

" 2. Hybrid Cactus Dahlias. Any colour. 3 blooms, 1 variety.

" 3. Decorative Dahlias. Any colour. 3 blooms, 1 variety.

Class 4. Peony-flowered Dahlias. Any colour. 3 blooms, 1 variety.

" 5. Single or Duplex Dahlias. Any colour. 3 blooms, 1 variety.

" 6. Any other type not provided above. Any colour. 3 blooms, 1 variety.

Sweepstake Prize

SECTION II

Class 1. 3 Cactus Dahlias. 3 varieties.

" 2. 3 Decorative Dahlias. 3 varieties.

" 3. 3 Peony-flowered Dahlias. 3 varieties.

" 4. 3 Dahlias. 3 varieties.

Sweepstake Prize

SECTION III

Class 1. Seedling of 1920. 1 or more blooms, 1 variety.

" 2. Collection of seedlings of 1920. Any number of blooms.

SECTION IV

Class 1. 3 Pink Dahlias. 3 varieties.

" 2. 3 Lavender Dahlias. 3 varieties.

" 3. 3 Yellow Dahlias. 3 varieties.

" 4. 3 White Dahlias. 3 varieties.

" 5. 3 Red Dahlias. 3 varieties.

" 6. 3 Variegated Dahlias. 3 varieties.

Sweepstake Prize

SECTION V

Class 1. 3 Pink Dahlias. 1 variety.

" 2. 3 Lavender Dahlias. 1 variety.

" 3. 3 Yellow Dahlias. 1 variety.

Class 4. 3 White Dahlias. 1 variety.
" 5. 3 Red Dahlias. 1 variety.
" 6. 3 Variegated Dahlias. 1 variety.
Sweepstake Prize

Section VI

Class 1. Artistic Arrangement of Dahlias. Any foliage or berries may be used.

A couple of classes for the novice may make a happy addition:

A. 3 Dahlias. 1 variety, any colour.
B. 3 Dahlias. 3 varieties, any colour.

giving a chance to someone who has never made an entry before.

Under Section IV arrangements of dahlias can be subdivided into classes such as

1. Vase or Bowl of Dahlias
2. Basket of Dahlias
3. Bouquet of Dahlias

or classes for flower arrangements other than dahlias may be added. The Short Hills Garden Club has at all its shows a class for children's arrangements of wild flowers. These add variety and zest to the show, and give an opportunity to those whose dahlias have failed.

This schedule, modified or enlarged each year, has been much complimented by experts, and often copied by other societies and garden clubs. It gives the small gardener all the opportunity he needs.

Any association affiliated with the American Dahlia Society receives a silver medal to be competed for at its local show. It should, of course, go to the exhibit which makes the best score of points.

This affiliation scheme, by the way, is most valuable to any garden club or local organization. The fee is but ten dollars, whatever the size of the club, and ten copies each of the quarterly bulletin of the society are sent to the club's secretary for distribution. The medal alone is worth the price, and proud indeed is the lucky winner.

I have found that the average amateur covets a ribbon or trophy far more than any money prize. When arranging the schedule, remember that a person winning a first prize of three or five dollars has spent four or five times that amount to do so. Of course, the five dollars will buy the tuber of a new variety for next year; but the chances are that the money is slipped into the pocketbook and we forget to put it away for that purpose.

Did you ever look through the trophy book of a *real* dahlia fan? Watch his eyes as he shows you his blue and red ribbons, and the exhibit cards with prize pasters on them. Locked securely in his cabinet are the medals which he shows you with exultant pride. In his den are

the Certificates of Merit all neatly framed and valued above everything else, except, perhaps, his own hybrids themselves, now blooming in other gardens besides his own.

First, second, and third prizes in ribbons in appropriate colours should be awarded in each class of each section of the schedule with a special "Honourable Mention," if a fourth vase is worthy. A sweepstake prize in the form of a cup, vase, or other article should be given the exhibit which wins the highest number of points in its section. Such a prize is usually donated by a member of the garden club or organization. Only an exhibit of merit should be awarded a prize. No prize should be awarded in any class having only poor exhibits placed therein, and at the discretion of the judges second and third prizes should be omitted where the exhibits are not up to the standard.

If only one entry is exhibited in a class there is no competition, and therefore no award can be made. This does not debar the exhibit from competing for the sweepstake in that section.

A grand prize is one which goes to the winner of the largest number of prizes or of sweepstakes. This is to encourage exhibitors to put in as many flowers in competition as possible.

A prize, such as the medal of the American

Dahlia Society, may be given to an exhibit which wins the highest number of points in the hall. It is sometimes called a grand sweepstake and is the highest honour which could be given.

A prize should be awarded for the most *meritorious* exhibit in the show. It could be won by the finest collection of seedlings, or by a vase of a "tested" dahlia—i. e., three years old, hybridized by the exhibitor, although maybe only placed in competition with others.

It could be won by a potted dahlia plant placed in the hall as a "special" class, or by anything which denotes unusual effort and success.

In planning a dahlia show one cannot begin too early—a whole year is not too soon. While the dahlias are blooming, future exhibitors can choose the varieties which they feel will bring them success. They can order them at that time with a certainty that they will be received in the spring; and the committee planning the show can get some idea what will be available, and arrange the classes to that end.

Publicity plays an important part if the show is to be a success. Give everyone plenty of time to prepare for it. Do not, however, send the schedules out too far in advance; they are easily mislaid or overlooked when the day

comes to fill out the blanks. Two weeks or less is plenty of time.

Entry blanks should be made as simple as possible if the show is given in a community where the exhibitors are not accustomed to them. They are intended merely to give the committee an idea how much space to provide for the classes; whether there are to be three or fifty entries. To this end they should be returned a few days in advance of the show. The simplest entry blank merely contains the numbers attached to the classes, with a request that the exhibitor draw a circle around each number in which class they expect to exhibit. (*See A*, p. 168.)

The more common form has space provided for the name of the exhibit as well. (*See B*, p. 168.)

The small entry fee may be asked to defray expenses if necessary. I have never known an exhibitor to begrudge a dollar for this purpose.

Exhibit cards are a problem still to be solved in a satisfactory way. The old method of placing them in sealed envelopes until all judging is finished is both expensive and cumbersome. The better way is to have a plain paster laid over the exhibitor's name on the card, and on which the exhibitor's *number* has been written. This may be torn off after judging is finished, exposing the name.

White exhibit cards are an eyesore. Brown or

A

I desire to make entry in classes checked below at the Dahlia Show of the Short Hills Garden Club, to be held on September 30, 1921, and enclose one dollar entry fee.

_____
Name

_____
Address

Section	Classes
I	1 2 3 4 5 6
II	1 2 3 4
III	1 2
IV	1 2 3 4 5 6
V	1 2 3 4 5 6

B

I desire to make entry in classes as indicated below at the Dahlia Show of the Short Hills Garden Club, to be held on September 30, 1921, and enclose one dollar entry fee.

_____
Name

_____
Address

Section No.	Class No.	Name of Class

dull green cards cost no more, and when printed clearly are just as legible. Have two holes punched at the top of each card and with a tie string attach it to its own vase. In this way the judges may move the vases about to compare varieties, without risk of losing the cards belonging to them.

SHORT HILLS GARDEN CLUB

Section .....

Class .....

Variety .....

Exhibitor's Name .....

In arranging the sections and classes about the hall have an eye for beauty. Do not place the class for lavender dahlias next to that for red ones.

A class for peony dahlias may already have a vase of lavender Mme. Bijstein placed in it, and if someone should bring rose-pink Duchess of Brunswick ask him to put it as far from the

lavender as possible, arranging Queen Wilhelmina or some other white between.

The light cactus types do not look well beside the massive show or decoratives. Place the peony types between. Little pompons, on the other hand, do look well with the heavy ones, as it accentuates their daintiness.

The points for judging dahlia exhibits as adopted by the American Dahlia Society should be invariably used at all dahlia shows. It helps to standardize the points of the flowers:

	POINTS
Colour	20
Stem and foliage	25
Substance	15
Form	20
Size	20
	100

Judges should each be provided with paper and pencil and carefully go over each exhibit, scoring carefully the faults. In no other way can the awards be justly made. They must abide strictly by the rules laid down by the show committee, disqualifying any exhibit, no matter how fine, which does not conform to all of them.

The exhibitor can in no other way learn to do it correctly.

No one but the judges and members of the committee should be allowed in the hall at this time. It is distracting to the judges and unfair to the exhibitors.

In the case of flower arrangements, it is wiser to have an entirely different set of judges. The points of the dahlia blooms are not as important as the general effect, and an artistic rather than a scientific eye is necessary for placing the awards.

Table decorations and flower arrangements should be by themselves. The former as we see them at most of the shows are unsightly in a hall on account of the glaring white tablecloth supplied. Let me suggest giving the exhibitor a bare dark table, letting him supply his own covering, glass, and china. It will not take long to revolutionize these exhibits. Half the beauty of a table decoration is the arrangement of quaint china, unusual candlesticks, and soft-toned covering—either rough crash embroidered in dull colours, or old lace on mahogany. The flowers on the table can then be made to harmonize with their surroundings.

Take, for example, a table decked with old Spanish china. Four twisted dull-green candlesticks stand on the four corners of a brown linen

centre cloth. In the centre is a low bowl of ancient Spanish lustre holding three or four rose-tinted dahlias and a few ferns. The dark wood of the bare table is relieved by the quaint service plates in green and lustre. One can talk across such a centrepiece, and the whole looks inviting for a friendly meal. How does it compare with the usual white cotton tablecloth, cheap china, plated candlesticks with pink shades which are provided; among which you are expected to place a tall vase holding a bunch of flowers looking for all the world like a feather duster, and at the base of which are arranged flowers to look like a funeral wreath?

Arrangements of flowers in bowls and baskets should, if possible, be placed on pedestals and tables of various heights, according to the manner in which they may be shown to best advantage. This gives a wider scope to the design for these arrangements.

A tall urn holding a few large dahlias may have some showering, trailing vine, intended to hang below its base. This requires a high pedestal. A flat bowl with a few dainty blossoms needs to be on a lower level for closer inspection. Some massive arrangements in baskets may either be set on the floor or on a stand not more than two feet high.

To the uninitiated, the placing of exhibits at a flower show as scheduled here is simple enough —maybe it is if you know how.

Study the rules carefully, even before studying the schedule. Entries must be in before a certain date. Exhibits must be in place before a certain hour on the great day. Exhibit cards must be displayed with each vase, and every variety must be *distinctly labelled* with its correct name.

If you have three blooms of Pierrot, for instance, which has reverted, as it frequently does, from its correct variegated form, to a plain colour, do not exhibit them under any circumstances. If labelled "Pierrot" they will be judged according to the standard of the correct Pierrot and will certainly lose.

Do not exhibit a decorative dahlia which shows a centre, either, among decoratives or among the peony-flowered types. It will also be judged according to the correct type of decorative, and disqualified.

Most people become colour blind in their excitement just before a show. I have known a gardener to place Attraction in the class of pink dahlias. As it happened, the three blooms were the finest on the table—of perfect form, of equal size, and had they been placed in their proper class, would have scored 100 per cent. But

they are lavender, not pink, and had to be disqualified!

When staging a dahlia exhibit be sure that all the flowers of one variety are of equal size and merit. If a class calls for three blooms of one variety, do not put in two huge blooms of perfect form and one of mediocre quality. It is better to put in three medium-sized flowers, all of equal value. Another important thing to remember is that a *bud showing colour is a flower.* An exhibit of three blooms, one of which has a bud attached, showing colour, is really a vase of four blooms. Such an exhibit is disqualified if placed in a class calling for three blooms. Dahlias, properly grown, should have been disbudded, so there is no excuse for the presence of the bud, anyway.

When exhibiting in a class of more than one variety of dahlias in one vase, have pity on the judges and the visitors. Do not put pinks and bright yellows, purples and reds together. Such an exhibit can be judged only by points, and under stress of circumstance might even win an award; but the comments of both judges and visitors may not bear repetition.

You will find that in spite of the hard-and-fast rules of judging by points, an exhibit well staged will hold the attention of the judges and has a much better chance for an award than one which

is poorly set up. Where but three or four flowers are needed, face them all directly toward you. Three or more should be arranged so that some stand above the others, placing them in a group rather than in a row. They should be firmly held in place in the vases, yet not strangled. A bit of excelsior tucked in between the stems will hold them well. Put most of it in front, shoving the stems back, holding the heads well up. Some people use paper, but I find that it becomes saturated quickly and loses its grip. Do not use old leaves and stems. They decay and poison the water, and your beautiful flowers soon become wilted.

If foliage is permitted in the vases, as in the show of the American Dahlia Society, choose what will best act as a background and what will be most becoming to the flower, bringing out its best points rather than that which will only make a pretty arrangement. Remember that it is the *dahlia* which is to be judged.

In placing your vase of dahlias in its group or class, try to choose its neighbours, so that both colour and form may be enhanced. Bring your flowers early so that you may have plenty of time to arrange them, and remain in the room until the judging commences, to see that your exhibits are not pushed out of the way.

There is always one bone of contention which comes up at every flower show. It is that flexible line drawn between the amateur and the professional.

We amateurs are dreadfully afraid of the professional when it comes to competition. They loom up in our thoughts like a bugaboo. We who dig in our own gardens dare not compete with a man who has acres of dahlias and an army of men to cultivate them. We argue that we do not have a fair chance against such odds. Yet if we went to some of the meetings of florists' clubs, we would be surprised to hear these very professionals argue that they cannot compete with an amateur because they have not the time to bring their blooms to such perfection! They must take care of thousands when the amateur may have only a dozen on which they spend all their time, thought, and money!

Then comes the everlasting question, "*What* is an amateur?" The American Dahlia Society has adopted the following rule: "An amateur gardener is one who does all the work in the garden except the plowing or spading, and who is not engaged in gardening as a livelihood." Those who employ men to do the work, and who expend their thought and their money upon the

garden, entirely for pleasure, are amateur gardeners as well; but are considered by the American Dahlia Society as private growers, and a special section is provided for them. The "little gardener" who digs in his own garden has far less opportunity against these large estates than against the professional. It is for this reason that I have recommended the simple schedule of small classes for the average community show.

An amateur does not lose his or her standing by selling surplus stock and purchasing new varieties with the money. This is not being "engaged in gardening as a livelihood." Surplus stock often is exchanged for something coveted in a neighbour's garden, but if your neighbour does not chance to have what you long for, or does not happen to need what you have for exchange, there can be no harm in selling what would otherwise go to waste, and with the money purchase what you wish. The "little gardener," who is an amateur in the truest sense of the word, can never hope to possess the expensive new varieties in any other way.

In local communities it is never wise to allow amateurs and professionals to compete against one another. It is a disadvantage to both; nevertheless, the professional should by no means

be excluded entirely, even from a show which is strictly amateur.

At the shows of the Short Hills Garden Club a limited amount of space is allowed at the discretion of the committee to each local professional in good standing who applies well in advance; where he may put up an exhibit of new and rare varieties not for competition. If such an exhibit is of special merit, a gratuitous ribbon award is made for the sake of encouragement. Such exhibits are of great interest to the visitors and are profitable to the dealer, who may take orders for roots to be delivered in the spring.

The United States Department of Agriculture, Bureau of Plant Industry, issued in 1919 a most excellent paper by Mr. F. L. Mulford on "Horticultural Exhibitions and Garden Competitions," called "Circular No. 62." Every garden club should have it in its library, as all the advice is excellent and put in the simplest language.

CHAPTER XIII

COLOUR COMBINATIONS IN THE GARDEN AND AS HOUSE DECORATIONS

UNFORTUNATELY, too many people grow dahlias as collections only, planted in the kitchen garden or behind the barn or anywhere the soil seems suitable. The borders are seldom resplendent with them at a time when they are in dire need of colour. How many dahlia gardens are there which are planned and planted with a deliberate intent at colour harmony and decorative effect?

The stumbling block in the minds of most people to the planning of a dahlia garden is that the ground is bare in the early spring and so becomes an eyesore. This can easily be overcome by judicious foreground planting. One of my dahlia gardens is situated just beyond and below the rose garden. Its beds are edged with small boulders quite hidden with creeping phlox, through which nearly fifty varieties of the rarest narcissi appear each spring, some thousands in number. In June, when the "daffy"

leaves turn yellow and die, and the bare stakes have been set in place, the climbing roses which drape the cedar posts and chains, marking the boundary of the rose garden, are all aglow with pink and white and red and yellow. The tall "perpetuals" reach up to meet the climbers and the little tea roses bring the colour down almost to the stone paths, edged with sweet alyssum and tiny sedums. The bloom at that time is so glorious, no one has a thought for what may be behind it; and when July comes and the roses flag, the dahlias have made headway enough to show a good green background.

By the first of August, the "old wood" of the climbing roses has been cut out, and a few of the dahlias not destined for exhibition purposes have been allowed to bloom. Their smiling faces peep at us over the roses and we are invited to come out and enjoy them.

My "trial garden" is seen beyond a sweep of lawn. It is thirty-five feet wide and is interspersed with a few laurel bushes which discreetly keep their feet under their petticoats and never encroach upon the domain of others. In the foreground are low-growing shrubs—none more than three and a half feet high, planned to give bloom in the spring and fruit in the autumn. In front of these are peonies, the old-

fashioned kind without names, so far as I know, which every year give a wealth of delicate pink blooms in spite of neglect, while phlox Miss Lingard blooms abundantly there also. By breaking off the tops of the passé flower heads more flowers quickly form on the side shoots, causing them to bloom from July to mid-October. In front of these are veronica, Achilles' pearls, stachys, sedums, etc., with here and there a summer cypress to blend with the autumn tones of the background.

The background slopes up toward a distant hillside, resplendent in dogwood and sumac. A few "smoke trees," some tall bamboo and pampas, make the frame ready for the picture when it comes. Looking across the lawn the foreground shrubs completely hide the bare earth of the dahlia beds from view. The laurel when in bloom seems to become part of the woodland beyond, and no one can suspect what is in store.

White and pink and palest yellow dahlias bloom where the phlox and achillea may snuggle at their feet. Sedums and summer cypress tone in with those of autumn tints, but being only a *trial* garden it is not possible to plan a very definite colour scheme.

The colours of but a few dahlias will quarrel

with one another. Only the lavenders must be kept apart, and strong yellows should not go near the pinks. Mass planting for distant effect allows many colours to rub elbows where close proximity of paths and walks could not. In this trial garden go "two-year-olds"—seedlings of the year before, both my own and those of growers from other parts of the country. There also go strangers from foreign lands whose colours are unknown to me further than the descriptions given by their originators. Woe to any whose pink turns blue or whose white turns green in soil and climate to which they are not accustomed! Like Alice's Red Queen, the word is "Off with his head"! But if they behave properly they will be allowed in the *real* dahlia garden next year.

On a cold and stormy night next November, when the roots have been put to bed and their spring breakfast prepared for them, pull your chair up to the fire. Bring out the list of what you have, and the list of those you saw at the shows—and, perhaps, have already ordered. Group these lists together under headings of their colours and subdivisions of colours. The deep red, bright red, old rose, bronze, and brown; golden yellow (very few), sulphur yellow, orange

and blendings of all—these are the autumn tints. Then there are the clear pinks (very few), soft pinks, and iridescent pinks, the pure glistening whites, those with a greenish tinge, or a pinkish, or maybe a tint of yellow at the base of the petals. Last are the lavenders and purples which can only associate with white. Few lavenders keep a pure colour in hot weather, and when the weather turns cold they acquire a pinkish tone.

They all, however, make a beautiful picture when grown with white dahlias or those of palest corn colour. In the mixed border use the gray-green foliage of sea lavender, stachys, white mullein-pink, and double gypsophila whose gray stems and dried flowers make a beautiful cloud. Bocconia and meadow rue and white statice may be set between the plants. Their roots run downward and take no nourishment from their neighbours. Snow-on-the-mountain, white petunias, and white giant zinnias may be used as fillers around and in front. St. Egwin aster or white phlox, used with care, not to allow either of them too much headway, makes a touch between the taller and the lower kinds; and between the edging of stachys, mullein-pink, etc., tuck in a few plants of heliotrope or sweet alyssum and Stokes' asters. It is possible, down

around their feet, to plant a touch of palest pink—godetia, sweet balsam, petunia.

There are not many lavenders of dependable colour. Bianca, a beautiful hybrid cactus, Shudow's Lavender, and Mme. Bijstein have never failed for me. They are free flowering and graceful. Millionaire and Lucy Langdon, one large, the other medium sized but always covered with bloom, are liable to have white centres in the hot weather, but when nights become cool again are a wonderful shade of pinkish lavender. Attraction, the aristocrat of all lavenders, is for most people a shy bloomer, but the refinement of the bloom and grace of its carriage well repays the space it may take. When Le Grand Manitou turns truly purple he is glorious; and with Meyerbeer, though of pendulous habit, also J. K. Alexander, can make the dark touch in the picture.

Clear pink is the rarest of colours in a dahlia. There is but one truly clear pink, a charming medium-sized decorative called Délice. Of French origin, it has been a favourite for many years. Newport Wonder, a giant single, runs it a close second, and Crystal, an incurved cactus, free and graceful, though tipped with white, is almost spring-like in its airy daintiness. In the mixed border plant them with boltonia, with

feverfew and white lupines. Add pale pinks and gray about their feet, mixed with alyssum. There are white mignon or Tom Thumb dahlias which add cheer at the feet of the tall ones. Pink mignons are inclined to have a purplish tinge in most soils, but the white ones add greatly to either the pink or the lavender beds.

When the pinks are to be combined only with other dahlias use Hortulanus Fiet, Crystal, or Niebelungenhort combined with the whites of Madonna behind and Snowdrift (Broomall) in front. These pinks are of medium height, while Madonna stands tall and stately and Snowdrift is of stocky growth. Between them place Cæcilia or Melody or J. Harrison Dick, all of the palest yellow, loose-petalled, graceful, and free.

Nearly all good pink dahlias, in order to shut out the lavender tone, have a bit of yellow in their blood. This accounts for the sympathy they seem to have for any yellow which does not kill them outright.

Reds are the hardest to manage—so difficult are they, that some with a sensitive eye will have none of them in the garden. The autumn border, however, having vivid red blended with orange and bronze, softened by golden yellows, is exhilarating to behold, yet restful to the eye. Here, also, one has almost unlimited choice, and

accidental neighbours often make charming associates. With them may be grown gaillardia, sneezeweed, zinnia, nasturtium, annual poinsettia; even the African marigold melts into the picture.

Tenderest recollections have I of a dear garden now gone, which possessed at a secluded end a Red Walk. A stately double row of tall Katherine Duer and Kalif flanked each side of a wide path. In front there grew vivid cannas, blood red in hue, without a hint of brick. At their feet grew the humble red geranium of like pure tone, softened by the green of peony foliage just turning as it dies. It was not intended as a place to linger and sit. One walked through it with military step—exalted.

Red dahlias, grown en masse, looked at from across a sweep of lawn, make a stunning picture. Place them in front of a row of "purple fringe," now gone to seed, with red-berried dogwood as a background—or if you are fortunate enough to have a planting of sugar maples and a silver maple or two your picture is already painted.

Old rose, like rare wine, should be treated with respect. If pure in tone, these dahlias should be planted with soft grays and dull white. Boltonia again will lighten the upper part of the picture, and some of the grays used with laven-

der will make a suitable foreground planting. There are some tones of old rose, such as Emily D. Renwick and George Walters, which have a golden sheen. These may be planted with soft yellow, choosing only the forms which look well with one another.

Cerise red and cerise pink look best with white. They are so vivid that unless treated carefully they make too sharp a note in the landscape.

Next rarest to the pinks are the pure golden-yellow dahlias—the yellow of an old-fashioned Persian rose. There are lemon yellows, sulphur yellows, and many shades of orange which, strangely enough, will not agree in the garden. Choose your yellows carefully, and never trust a catalogue description. Plant them with deeper shades or variegated, where they will be happiest. Yellow Hammer, though a shy bloomer, a true cactus dahlia, is the best in colour, though singularly enough, an unsympathetic flower is grown alone. Sulphur yellows, such as Mrs. Richard Lohrman, massive in form, and always covered with bloom, cannot associate with anything but white or deep purple. It is those that are softened with a glow of pink which will blend with bronze or fawn or even red. Take, for example, that variable Dutchman, King of the Autumn. He agrees with nearly every dahlia.

Planted in a mass of twenty or more in the corner of the shrubbery, he will turn a gray day into bright sunshine. Plant at his feet a mass of dwarf nasturtiums, chosen for their yellows, and you will have a never-ending joy.

Plant dainty Melody (Stredwick) together with Pierrot. Their graceful nodding heads on tall slender stalks look well behind a clump of common meadow rue. The rue will throw up fresh stalks of golden-orange flakes every time they are cut down, and their fernlike foliage quite covers the ground.

Pale yellows tone well with the purples. A bushy clematis, Davidiana, about four feet high and covered with deep purple flowers in September, makes fine contrast to most of them, and if between the edgings of alyssum or yellow violas a few plants of deep heliotrope are set we cannot ask for a more dignified combination.

The yellows variegated with brown or red or fawn can be planted almost anywhere together. They can have as associates rudbeckia, sunflowers, sneezeweed, Blanket Flower, blazing star, flame flower, annual poincettia, African marigolds, and may be edged by French marigolds and pot marigolds, even carefully chosen portulaca. Tone the colour scheme down, however, with judicious planting of green.

Dahlias of dull fawn, of dove colour, of gentle iridescent pinks all keep company in happy mood. Keep the background dark in tone—high shrubs at a distance, and the palest of foreground sets them off to best advantage.

In planting dahlias together, form and habit must be taken into consideration as well as colour. A great massive decorative is too overpowering for a dainty cactus or a gentle peony. There are smaller decoratives which are well offset by a large cactus or peony. Singles should be set apart from all other types and look better among herbaceous perennials than when planted alone. Little Tom Thumb or single Mignons add greatly to the charm when set at their feet, among other flowers or foliage of soft cloudy effect. Collerettes should be treated as are the singles, but seldom look well if planted with them. White singles and white collerettes with yellow centres planted with Michælmas daisies make a combination never to be forgotten. Pompons are seldom an artistic success in the border, though there are exceptions when they are heavy bloomers, or where much colour is not needed.

It is a mistake to think that varieties which are principally used for exhibition purposes are unsuitable for the garden or mixed border. Most of those I have already mentioned are

prize winners at some of the largest exhibitions, and they may be cultivated and disbudded in the border just as well as in the patch behind the barn. They like each other's company and do better in the border if planted in groups of three or more; but it is in the true dahlia garden, carefully planned, well prepared and planted, that the finest of all flowers unfolds her beauty and does herself full justice.

There need be no limit set to design or colour scheme. There are dahlias of every habit—some so tall that they may be made to climb, and some so low that they almost seem to creep. There are six sevenths of the rainbow to choose from—more hues than even the rose may boast of—and every combination of colour in twos, threes, and even fours. There is no flower known which has as many forms of bloom, each lending its own individuality to the garden or the decoration.

The pompons, for many years almost unknown to the gardeners, have found themselves again. Though not so well adapted to the border, they are invaluable as a dinner-table decoration. Gretchen Heine, for instance, one of the few flecked dahlias which I personally care for, is a delicate pale pink, touched on the edges with a deeper pink. Set into a pale blue bowl with a

cloud of clematis panniculata, there is nothing more dainty and spring-like in September. It may also be combined with some of the little "Star" singles, set in a white bowl on a teak-wood stand with a few sprays of clematis gone to seed.

Then there are the pale yellow pompons Gannymede, tinted pink, or Little Beeswing. Combine them with deep blue spires of veronica in a vase of golden Ruskin pottery. Add the foliage of rue if you have no maidenhair.

The airy singles, always lovable and human, look well in baskets of eighteenth-century design. St. Egwin aster grouped with some of the clear pinks makes a charming combination.

Many people condemn the silver vase for any flowers, but I still maintain that they are beautiful with flowers that become them. Place lavender Mme. Bijstein and white Queen Wilhelmina, together with gray foliage from the gray border, in a tall silver vase. Set them before a velvet curtain of deepest sapphire blue and see if a silver vase is not beautiful.

Once, when a dahlia show had used up all my vases, and I had nothing else but a tall silver urn to hold the dahlias for the drawing room, I stood before it with an armful of J. Harrison Dick and wondered if I dared. Into it they had to go,

pale corn-coloured, upright heads, and the showering back petals touched with palest lavender. Something was needed to blend the yellow with the silver and looking through the window, St. Egwin aster called to me. Just try that combination.

Copper jars, not too brightly polished, will hold the autumn tints. Use sumac and the brown leaves of bracken, and the copper will take up the reflection. Bronzed oak leaves may be used with the more massive types, while red-berried dogwood and the crimson shoots of young Virginia Creeper do better for the more delicate cactus varieties. Tall pampas grass will lighten the effect with hybrid cactus.

There is a grape which clambers over wall and fences all about our place, from early spring until the killing frost. It is indispensable to me for house decorations. Some people call it variegated vitis. In the early summer, the tender shoots of palest pink, bearing tiny pink leaves, rosy tendrils, and minute fragrant blossoms, add to the charm of every group of flowers. During the hot weather the small deeply cut leaves of dull gray, here and there touched with pink or pale yellow, melt in with any flower I choose; but its full glory comes in September when its branches are laden with berries of

brilliant turquoise blue. The young shoots with leaves always flecked with pink, or wholly pink, drape gracefully over bowls or vases or baskets, softening the edges as only nature can. The turquoise blue in strong contrast with small pale yellow dahlias in a dark bronze Japanese bowl makes a picture of which any Japanese might be proud.

Any one possessing a jar of unglazed and undecorated Indian pottery is indeed fortunate. In it place one or two dahlias of any shade of pink or yellow with a trailing spray of this berried grape.

Vases for dahlias should be opaque. Stems stripped of their leaves are not beautiful to look at, and must be hidden. But vases, though necessarily forming part of the picture, must be inconspicuous—must form part of the background as it were. Bowls are suitable only for small dahlias, such as the smiling "Star," or Annette Reynault, or Effective, and the little pompons, etc. A mass effect in a great jardinière of copper or dull old pottery should only be placed for distant effect in a room plenty large enough, or it will be overpowering.

The most effective way to arrange large ones is in something tall and slender—only a few at a time, for the individual bloom is so beautiful that it is a pity not to have each show to best

advantage. Group the types together, but not more than two varieties in the average vase when the blooms have any individuality. *Always* have the stems as long as possible in proportion to the size of the bloom. A dahlia eight to twelve inches across should have a stem three feet long at least.

If you have Délice, arrange it in a dull-green vase with deep-purple heliotrope. If you have Ballet Girl, arrange it with Statice—in fact, use Statice all you can with the pale cactus types. Lay blooms of Crystal in a gray-blue bowl; again use statice and maidenhair rue. Place Valliant or Kalif in black glass or darkest bronze. Add deep-bronze oak leaves and a touch of berried dogwood. Insulinde, Princess Pat, and dahlias of upright habit need but little "trimmings" save to soften the lines of the vase itself.

Through some accident maybe one of your finest blossoms will have been whipped from its stem. Do not weep and throw it away. Use your black glass bowl and float it on the surface of the water, adding ferns also floating, and a few in an upright holder. Put it under a table-lamp so that the light may shine directly upon it, and the whole room will be filled with that dahlia, radiating its colour and its cheer among all the occupants.

CHAPTER XIV

VARIETIES IN ALIEN SOIL AND CLIMATE

THE dahlia is a paradox. There is no flower which can be more accommodating to soil and climate; yet there is none so temperamental when it is pleased or displeased with its food and surroundings.

A variety may change its colour like a chameleon. Some behave like veritable Doctor Jekylls and Mr. Hydes, changing form and habit to suit their own tastes. Sometimes a variety grown in England would not recognize its twin sister grown in some parts of the United States. A variety bred in California may hardly be recognizable grown in Colorado. It all depends on soil and climate.

There is no state in the Union that does not boast of a dahlia garden somewhere within its boundary. From northern Florida to southern Alaska they grow in profusion. Tiny cottages on the hillsides of Porto Rico and our newest acquisition, the Virgin Islands, are ablaze in late summer with them. On the mountain

slopes of the Philippines, dahlias, escaped from cultivation, are trying to be Acocotli in a new land. In India and Ceylon they have also run wild in the highlands. Wherever white man has settled he has brought his dahlias with him and they have thrived.

In South Africa, in South America, in New Zealand, and Australia they are coming into their own. In China and Japan they grow abundantly, and the Japanese have commenced to hybridize them. What dahlias may be made to do in the hands of these magicians there is no telling. The hardier, more common forms will grow almost anywhere in spite of neglect, but where there is an abundance of fresh air and water, the finest varieties of dahlias may be made to thrive, provided that they receive intelligent care. It is only the fastidious connoisseur who will notice the changes wrought by climate and soil. To the rest of the world dahlias are dahlias and are beautiful—and that is enough.

There are soils and climates which agree so well with them that with the most ordinary care they far outstrip other localities not so favoured. These other people must use food and moisture to compete in the battle for honours —but it can be done nevertheless.

The Pacific Coast, the garden spot of our land,

undoubtedly has the victory over the rest of us, both in the size and profusion of bloom. There, on account of the long, cool growing season, causing an easy production of late seeds, hybridization has made the greatest strides. With but two or possibly three exceptions the growers there strive almost exclusively for the heavy decorative and hybrid cactus types. It is only lately that a few of them have put new blood and some backbone into the incurved cactus types, giving them the strength of stem necessary to hold up their heads and reveal their beauty. But with that backbone comes a shorter and less twisted petal than those from our cousins across the sea.

The general complaint against these incurved cactus types from England has been the weak stem, unable to bear the weight of the bloom. Some, indeed, seem to have a stem deliberately curved downward, rigidly holding the bloom like a tassel. The plum-coloured Dorothy Hawes, for instance, has a long stem for all the world like the symbol of the square root in our algebra books (√). Pierrot, Valiant, Melody, all hang their heads, yet their habit of growth and their delicate foliage compensate for this, and by disbudding and cutting them with very long stems they are unsurpassed for house decoration.

Lately, the English, also, have succeeded in putting backbone into their incurved cactus, keeping the slender petals of the type. British Lion, of Pierrot colouring, holds his head aloft, and looking at him you can almost see him switch his tail! The petals twist and interlace far more than do those of Pierrot, however, and seldom do they show a tip of white. The new Miss Margaret Stredwick, a glorious pink, is probably at this date the finest incurved cactus dahlia known, for with all the perfect points of colour and form it has a stem almost as strong as a walking-stick.

It is a comfort to see weak-stemmed varieties losing favour. It means that the short-stem-in-a-milk-bottle exhibits will soon be a thing of the past, and the dahlia will be seen at the shows only in its own true dignity.

Just a few years ago the dahlia world was set agog by a wonderful pure-white peony dahlia of great size called South Pole. Glistening like the snows of its namesake, four times the size of Queen Wilhelmina, which was even then beginning to show deterioration, it was sought after by all. I shall never forget the first bloom which opened in my garden. Twelve inches across it was, but with a stem which deliberately grew into an inverted V (Λ)! It never bloomed there

another season—and seldom is it seen in the catalogues of to-day.

Shortly after that came Riesen Edelweiss, a truly beautiful white peony, into whose face one could look and whose purity, fine substance, and form won admiration everywhere. It, too, seems to have disappeared, as it was born in 1914 on the banks of the Rhine; but it deserves a better fate in spite of its heritage.

Many of the whites from foreign lands do not do well in this country. Ivory White and Frances White become quite green in some localities where the sun is hot, while Duffryn, an especially fine white cactus from England, and the decorative Polar Star, show no such tendency. Madonna, on the other hand, behaved beautifully when she first came over; a refined, pure-white flower called decorative, yet—except that she shows no centre—has all the gentle grace of a peony. The past two years in many parts of New Jersey Madonna has had temerity to blush!—but is no less beautiful, for all that.

The white dahlias from our own country are far ahead of those from overseas. For ten years or more hybridizers have struggled to produce a pure-white cactus dahlia which does not modestly hide its head among the foliage. It seems to have come at last, for there is no

white dahlia growing to-day which can in any way compare with Gladys Sherwood, a pure-white hybrid cactus of great size and substance. The slightly incurved petals give it an effect of delicacy and refinement in spite of its size, and the fact that it is large and holds its bloom a long time on the plant makes amends for the fact that there are not many at a time—there simply isn't room!

Another wonderful white, a decorative, free and prolific and of fairly large size, is Mrs. Henrietta W. Struck, sometimes called Purity. It gleams like icicles on the plant and under no circumstances turns either green or pink.

Some of the reds, which the English term "Hunter's pink," are nearly hopeless in our hot sun. Men have struggled with this colour in all flowers for generations, but "burn" it will, nevertheless. The old favourite, Katherine Duer, might be said to be the best, but it is such a late bloomer that I fancy it is only that which saves it. So late a bloomer it is that in many localities it never has an opportunity, for Jack Frost rings down the curtain before she has any chance to follow cue and make her bow. For this reason the variety is seldom listed.

Creation might be said to stand the sun pretty well. The colour is fine, though the form

is mediocre. I have found it to be an excellent seed-parent—the second generation having produced flowers on which I am building great hopes.

There is no doubt that only the primary shade of red will remain true at all times. Any dahlia of red overlaid with another colour is one which varies with the soil and climate. Take, for example, that glorious brown-rose Princess Pat. In the gardens of California and of the central and southeastern states it is always the same brown-rose. In the North; in Oregon and Washington, in Maine and in Canada and in England, it is overlaid with a distinctly violet tone, making the flower almost unrecognizable, except for its unusual form and habit.

Any red of the brick variety toward the end of the season, when the sun is low and the days are short, becomes a sickly, washed-out orange. Have you observed that noisy Gustav Douzon by mid-October? He has shouted the red entirely out of his system, becoming only part of the sombre background of russet.

Where red is variegated with white or with yellow the tendency is to go back to the red. Ballet Girl, a fluffy cactus of white with the base of the petals in red, will throw out one pure-red flower to two of the type. Geisha plays havoc

with her colours, but many plain reds are to be found on her plants, while plain yellows—never.

Orange variegated with red reverts to a plain orange most of the time. Pierrot, so charming when true, is a flagrant sinner in this direction, also disliking to show its white finger tips.

It is easy enough to breed a yellow dahlia if one is not particular as to the shade of yellow. Both the wild dahlias and the hybrids have a strong tendency toward the sulphur yellow—sometimes even with a greenish tinge. The pure gold in a dahlia is almost as rare as the pure gold in the earth; though once it is there it is there to stay.

I remember many years ago I exhibited at the Short Hills Show three enormous yellow blooms from tubers sent to me by a friend in Wiltshire, England. They were some of the first of the English incurved cactus types of a pale sulphur yellow with drooping tired heads, and were distinctly labelled with their correct name, Glory of Wilts. They were very unusual then, and I was very proud of them until I heard a visitor remark: "Well, I guess they named *that* one right!" Those drooping heads were never seen in my garden again.

Yellows overlaid with pink usually have a soft iridescence and warmth of tone. Without

it a dahlia—Yellow Hammer, for instance—seems to be moulded out of butter.

There are two yellow cactus dahlias with white tips, both named Melody. One came from Stredwick in England, the other from Peacock in New Jersey. Both revert to plain yellow and are as like as twins. Cockatoo is another, but of hybrid type. Sea-horse also is a hybrid cactus from California of exactly the same colouring and tendency to revert. In fact, one might say that a variegated dahlia is a glorified Dahlia Variabilis. Sooner or later they revert to the colour of which they contain the greatest amount of pigment. Mabel B. Taft, a substantial yellow decorative, is distinctly overlaid with pink, while Mrs. Richard Lohrman, a monstrous yellow hybrid cactus, has none of it and ranks among the sulphur-yellow dahlias.

Lavender is a ticklish colour to handle at all times, but more so with dahlias because they *do not want* to be lavender. There are a few, however, which have proven their worth. The oldest, called Libelle, of the size and form of Kremhilda, is still a favourite with many. It is small, dainty, and free-flowering but not steadfast in its colour.

Bianca, perhaps, ranks first a pure, true lavender hybrid cactus, intense in the cooler

Northern states and where soil is exceptionally sweet; pale and delicate in hotter places, but steadfast in its colour and free in bloom. Madame Van Bijstein, whose foreign ancestry is unquestioned, ranks a close second. A refined, graceful peony dahlia of exceptionally free-flowering habit and of medium size. She is very amenable to our moulding touch, and by strict disbudding will achieve great size, and sometimes become decorative in form.

Attraction, conceded by all to be the finest of the lavenders, is a shy bloomer and is often nearly pink in colour. A so-called hybrid cactus of exquisite refinement with frilled petals and long, strong stem which carries the bloom well above the foliage, whether pink or lavender, it at least is never magenta, and is beautiful at all times.

The lavender decoratives, of which, perhaps, the Millionaire on account of its great size is the most conspicuous, seldom do themselves justice in any but a cool climate. During our hot summer days the pigment is inclined to concentrate itself in the outer petals, leaving the centre almost pure white. When cool days come, however, their colour and texture resemble a silken brocade.

Beware of purples for they are born of magenta; that colour with which Nature loves

to goad us to exasperation. There are a few good ones, but, nevertheless, they have their faults. Manitou is good when he has reverted from the type (variegated with white), a splendid decorative. Meyerbeer, a pendulous peony of great size, will sometimes turn the plum colour of Cervantes' Dahlia pinnata—or a deep wine colour, according to the amount of lime in the soil or the temperature of the air.

Pink dahlias!—have you seen many *really* pink? Yes, Délice, but that is all.

Years ago there were no pinks. The nearest to the colour in the early days was Nymphea or Sylvia, "two names with but a single flower." They are the dear little blushing round blossoms seen in every dooryard for four generations, and even now are the most popular with the florist. After Juarezii arrived, the cupped petals were turned back and Kremhilda came into being, a cheery little cactus with white centre, identical in habit and colour. When Hornsvelt brought out the peony dahlia Gloire de Baarn, it seemed a real achievement. Not much later came Délice; she has stood alone ever since, and Gloire de Baarn is relegated to the scrap heap. Of course, there are now gorgeous salmon pinks, shrimp pinks, cerise pinks through every shade and combination of shades, but Délice stands

yet alone as a pure *pink* pink, although challenged many times.

Hortulanus Fiet, a veteran now, is one of the finest of soft pinks. Here, however, is a dahlia whose blending of tints is greatly influenced by its surroundings. A decorative of good size, fine substance, and habit, free flowering almost to a fault; the colour when grown in good soil in the open garden should be a warm, creamy pink. I have seen it grown in two neighbouring gardens near by, of tubers separated from the same clump; yet the blooms were so different in appearance that one could hardly believe they were related. One was the type—correct in every way; the other, grown in ground which had been heavily limed and soot added to the fertilizer; where trees kept it shaded most of the day. The colour was dark—almost brown, shading to orange yellow in the centre; the petals were loose and the stem weak. I have seen it grown in poor soil, neglected in cultivation, yet blooming freely, a poor pinkish white.

Crystal; delicate pink cactus, large, free in bloom for some, shy for others; keeps its white fingers better than most variegated dahlias. Inclined to be pendent, perhaps, yet with such grace and refinement that I feel none should be without it.

Andrew Carnegie, some fifteen years old, a creamy pink peony, has for a long time been especially desirable, not alone for its exquisite colour and unusual centre set like a jewel, but for the fern-like foliage which makes it a thing of beauty in the garden and unsurpassed as a cut flower. Of late I have found it inclined to become poor in colour soon after it commences to bloom and that the addition of a little lime-water when the buds begin to show has improved it very much. It is undoubtedly one of the best seed parents I have used where pale colours were sought for; and, probably a descendant of Dahlia Gracilis, endows as much as 50 per cent. of its children with its beautiful foliage.

My own Gertrude Dahl was one of these, though with heavier foliage, no more beautiful in its way, perhaps, than its parent; though a hundred times freer in flowering and with an iridescence in colour obtained from the pollen parent used.

Whether Wolfgang v. Goethe and F. W. Fellows may be called pink or red, they are certainly salmon, and rank among the very best. The former is one of the oldest, following closely upon the heels of the Countess of Lonsdale. Tall, upright in habit, unfailing in colour and generous in bloom, it is as beautiful to-day as it

was twenty years ago. Stredwick has enlarged it and named his new one F. W. Fellows. Just as fine in form and colour, twice the size, it bears fewer blossoms, but all growers are unanimous in its praise.

A rose pink, sometimes light, sometimes dark, according to the weather and the food, is George Walters. Always softened with a golden sheen at the base of the petals, always large and loose, always beautiful, yet no one can agree to what class it belongs. The American Dahlia Society has definitely placed it as a hybrid cactus—probably because it fits the other classes less. Indeed, the hybrid cactus class seems to absorb all types that fit into no other.

Some years ago a dahlia appeared from La Conner, Washington, for which it was named, of so unusual a form that it was called "Carnation flowered"—which described it exactly. An upright blossom of long fluffy petals on a wiry stem; a soft rose iridescent with blue and gold, the flower stands out in my memory above all others of those days. There was no class to fit it, and no dahlia society to regulate it. It was so frail, however, that the blossom seldom lasted more than a day after cutting, and so delicate were the tubers that it took a genius to winter it over. I doubt now if the variety exists.

J. Harrison Dick is much the same form except that the back petals hang down in a shower, but hybrid cactus it is dubbed for all that.

The upright stems are coming—one or two a year, now. Ballon was the first, a solid, stodgy decorative not more than two feet high. The blossoms of dull brown looked up at one begging to be pulled off and used as pincushions. Lately Insulinde has taken the world by storm. The flowers, though large and fairly double, remind me of that exquisite little iris cuprea in form, colour, and habit—copper, orange-gold, or golden orange, call it what you will, you cannot describe it, and you will always wonder at it.

Among the odd forms of dahlias are two types which stand out beyond the others. In 1914 the "Star" dahlias made a hit at the English shows, but have only just appeared among us here. Crawley Star is the best of them, a dainty cup-shaped single, evidently containing a drop or two of "cactus" blood, just enough to reflex the petals a bit. A rosy pink, better than most, of upright habit, rather small, airy, and dainty, it is one of the best for house decorations. It is not of great value in the garden as it gives but little colour effect.

The anemone-flowered types have lately come from France. Of all, Meissonier is the best on

account of its exquisite salmon colour and its fern-like foliage. The ray florets show a row of single petals while each inner floret is enclosed in a slender tube. The flowers are small and dainty, but none too many on a plant. Another variation of the type has white petals, and the group of unusually long tubes of bright yellow give the effect of a giant bi-colour daffodil. Already it is called "Narcissus flowering" and justly so.

In France they must have an especially long and slender insect to pollinate these dahlias, for here they never seem to set seed alone, and no instrument of mine, at least, has ever yet succeeded in reaching the pistil; and if I dare cut back the tube the flower sulks and says, "I won't."

There is a great future in this new "break" in form. We are only on the threshold, but I believe the day is coming when this class will rank in importance with all the best.

Of the fragrant dahlias, there is none which will make a bouquet really sweet. A few of faint odour there are when blooming during cool weather; but here again the future lies wide open. When they are sweet, the fragrance is that of a pond-lily.

There are many new varieties of dahlias bred on the other side of the Atlantic which are un-

known to us here. The Federal Horticultural Board, in its effort to prevent the further introduction of dangerous plant pests, does not permit commercial importations on a large scale intended for immediate resale. To protect the horticultural interests of the country, they have insured that no desirable new variety or kind of plant should be excluded; nor should any scientific worker, botanical garden or amateur collector be prevented from securing plants for study, hybridization, or other scientific purposes.

Nurserymen may procure propagating stock from abroad of varieties which are unobtainable in this country; thus in a year or two new varieties of dahlias may be sufficiently increased to supply the market.

Much greater progress has been made in this country than in the Old World so far as the handsome, showy types of decorative and hybrid-cactus are concerned. Each year a few new ones come out, finer, better than any previous—most of them from California, of course, the Dahlia Eden. It is to these we are indebted for the enthusiasm which is spreading like a great wave over the entire country. Our standards are raised with each achievement; not only in perfection of form and colour, but the stem, heretofore of secondary importance, must now

bear the flower aloft in order that the variety may be of use both as a cut flower and in the garden.

It is to be deplored that many of our finest varieties are still unknown in England. The war has been largely to blame, and previous to that time the growers had not realized what we have come to learn—that tubers planted in alien soil, enduring a strange climate, must be given time to become acclimatized. Many were disappointed the first year, and had not the patience to continue.

I have heard many an amateur complain of new European varieties, and have always begged them to try another year—usually learning afterward that they had much improved. The same thing often happens with western roots in the east and eastern roots in the west; though in many types and colours the soil will make a permanent difference.

CHAPTER XV

CLASSIFICATION AND CHART

THE American Dahlia Society has adopted the following nine classes into which the forms of dahlias may be divided. The definitions are as clear as possible, and the subdivisions place the hybrids. It has been a difficult problem to solve, and yearly becomes more so, for new varieties are constantly appearing which either blend the forms of two classes or are so totally different that it is almost impossible to classify them.

Class I.

CACTUS DAHLIAS

(a) True, fluted type: Corollas long, narrow, incurved or twisted, with sharp or fluted points and with the margins revolute (rolled backward or outward), forming in the outer florets a more or less perfect tube for more than half the length of the corolla.

Typical examples: Pierrot; Mrs. Douglas Fleming; J. H. Jackson; Valiant.

(b) Hybrid cactus or semi-cactus type: Corollas short as compared with previous type, broad, flat, recurved or

twisted, margins only slightly revolute and tubes of outer florets, if any, less than half the length of the corolla. This type intergrades with the decorative and peony-flowered classes.

Typical examples: Kalif; Futurity; Gladys Sherwood; Wodan.

Class II.

DECORATIVE DAHLIAS

Double flowers, full to the centre, early in the season at least, flat rather than ball-shaped, with broad, flat, somewhat loosely arranged floral rays with broad points or rounded tips which are straight or decurved (turned down or back) not incurved, and with margins revolute, if rolled at all.

Typical examples: Délice; King of the Autumn; Hortulanus Fiet.

Class III.

BALL-SHAPED DOUBLE DAHLIAS

(a) Show type: Flowers globular rather than broad or flat, showing regular spiral arrangement of florets, with corollas more or less quilled or with their margins involute (rolled forward or inward). (Dahlias of this type with flowers spotted, variegated, or parti-coloured were formerly classed as *fancy*, a group no longer recognized.)

Typical examples: A. D. Livoni; King of Shows; Gold Medal; David Warfield.

(b) Hybrid show, giant show, or colossal show, type: Flowers broadly hemispheric to flatly globular, loosely built, so spiral arrangement of florets is not immediately

evident; corollas broad, heavy, cupped, or quilled, with rounded tips and more or less involute margins. Verging toward the decorative class and sometimes found classed with the decoratives.

Typical examples: Mrs. Roosevelt; La Colosse; Grand Duke Alexis; Cuban Giant.

Class IV.

PEONY-FLOWERED DAHLIAS

Semi-double flowers with open centre, the inner floral rays being usually curled or twisted, the other or outer petals being either flat or more or less irregular.

Typical examples: Andrew Carnegie; Meyerbeer; Gertrude Dahl; Queen Wilhelmina.

Class V.

DUPLEX DAHLIAS

Semi-double flowers, with centre always exposed on opening of bud; with petals in more than one row, more than 12, long and flat, or broad and rounded; not noticeably twisted or curled. (Many so-called peony-flowered Dahlias belong here.)

Typical examples: Merry Widow; Sensation; Golden Sunshine, Mme. J. Coissard.

Class VI.

SINGLE DAHLIAS

Open-centred flowers, small to very large, with eight to twelve floral rays more or less in one circle, margins often decurved (turned down or back). (The type embraces

the large Twentieth Century, as well as small varieties, also Star Singles without subdivision).

Typical examples: White Century; Newport Marvel; Danish Cross; Leslie Seale.

Class VII.

COLLERETTE DAHLIAS

Single type: Open-centred blossoms with not more than nine floral rays with one or more smaller rays, usually of a different colour, from heart of each ray floret, making a collar about disk.

Typical examples: Mme. E. Poirier; Diadem.

Class VIII.

ANEMONE-FLOWERED DAHLIAS

Flowers with one row of large floral rays like single dahlias but with each disk flower producing small, tubular petals.

Typical examples: Mons. Chas. Molin; La Styx; Meissonier; Graziella.

Class IX.

OTHER SECTIONS

Miniature or Pompon Cactus: Small-flowered, stellate fine-petalled cactus dahlias represented by Tom-tit; Mary; Nora; Minima. Mignon or Tom Thumb: Dwarf, bushy, single-flowered dahlias for edging.

Typical example: Jules Closon.

Bedding Dahlia: A taller, more upright type than the Tom Thumb.

Typical examples: Barlow's Bedder and Midget Improved.

Cockade or zonal dahlias: Single or collarette dahlias, with three distinct bands of colour about centre. Type hardly known in America, but includes such forms as that of Cocarde Espagnole.

The accompanying chart of named varieties does not pretend to be a selected list of the finest chosen from the five thousand or more now listed in the records of the American Dahlia Society. It is a list compiled of those I personally know and have grown, together with those recommended to me by about twenty-five men and women, all experts, both amateur and professional, and which I have seen in their gardens.

Among the newer sorts are those whose names appear in no less than three catalogues of 1921 issued in this country, and which are highly spoken of by more than one person.

The old favourites are there also; some the survivors of 1840.

New varieties appear every year, and this list will soon be out of date unless the reader adds to it, in the spaces provided, those which he has seen at the shows. Others, not so new, which the reader may particularly admire, may have been left out. These also I hope he will add.

The choice of dahlias is largely a matter of taste, and both climate and quality of soil alter

colour and habit to a large degree. Space has therefore been provided for the reader's personal opinion regarding varieties which he has grown.

I hope that the chart will help the enthusiastic but distracted amateur to choose his varieties after the deluge of catalogues descends. Glowing descriptions and beautiful illustrations make the choice most difficult. Often a dahlia, intended to brighten the border, will be found useless for anything but the exhibition table; and those on whom high hopes for the show had been pinned prove to be no more than the "common or garden variety."

Among those classed as exhibition blooms are many which are shy bloomers, and are therefore left out of the garden class. Those listed as cut flowers are dahlias which may be handled without too much risk of wilting, and which are particularly useful for house decorations. Many, like George Walters, King of the Autumn, Gertrude Dahl, etc., although producing the finest exhibition blooms, are so free-flowering they may rank among the best of the garden types. Some, again, make excellent cut flowers for house decorations or for shipping as well as garden and exhibition blooms. These are listed under all three heads.

Under the column marked "Habit" I have

made note of anything unusual; whether the plant is tall or short or bushy, and whether the blooms are pendent or upright.

Any plants without notes in this column are of moderate height, with flowers of usual stem and habit.

Although I always use Ridgway's Colour Chart whenever listing colours for my own use, and I strongly recommend it above all others for amateurs, it is impossible to use in this list, for the reason that colours in dahlias vary so much with soil, climate, and even the different seasons.

CHART

ABBREVIATIONS

A.	Anemone	h.	Hybrid
B.	Ball or Show	l.	Little (dwarf plant)
C.	Cactus	M.	Mignon (single)
Col.	Collerette	P.	Peony
D.	Decorative	Pom.	Pompon
Dup.	Duplex	S.	Single
F.	Fancy or Ball	v.	Variegated.
g.	Giant flowers		

A

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
Col.		Achievement	Alexander	Maroon, white collar		x	x		
Pom.		Achilles	Peacock	Lavender, tips pink		x	x		
B		Acquisition	Schlecht-Fottler	Lilac		x		x	
A		Ada Finch	Cheal	White and yellow	Short	x		x	
P		Adah	West	Red	Tall	x			
B		A. D. Livoni	Storrs & Harrison	Pink		x			
D		Admiral Glennon	Mastick	Dark garnet		x		x	
P		Admiration	Breck	Buff and carmine		x		x	
C		Alabaster	Stredwick	White		x		x	
D	x	Aladdin	Burrell	Amber, tinted red		x	x	x	
Pg.		Alan Loma	Stillman	Pure white				x	
Dg.		Albert Manda	Manda	Lemon, white, and pink				x	
M		Albion	Cheal	Pure white	Dwarf	x			
C		Alight		Orange and scarlet				x	
D		Alice Roosevelt		White, suffused lilac		x			
Pom.		Allie Mourey		Pink		x	x		
Dg.		Alma Mater	Stout	White				x	
Col.		Altro	Peacock	Crimson tipped white, collar white		x	x		

C		Ambassador	Broomall	Buff and pink				x
B		American Beauty		Wine red	Short			x
Col.		Ami Nonin	Charmet	Amaranth shaded rose, collar white		x	x	
D		Amphion	West	Yellow and rose				x
D		Amy Robsart	Mastick	Coral, apricot reverse		x		x
P		Antoine Rivoire	Pivoire	Red		x		x
Col.		Ariel	Stredwick	Red and white		x		
Pom.		Ariel		Deep orange-buff			x	
B		Arthur Kelsey	Slocombe	Crimson		x		x
C		Arthur Pickard	Stredwick	Light salmon		x	x	x
Ch.	x	Attraction	Hornsveld	Light lavender		x	x	x
D	x	Autumn Glory		Apricot		x	x	x
Ch.		Avalanche	Nonin	White				x
D		Azalia	Boston	Yellow tinged pink		x		x

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

B

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
C	x	Ballet Girl	Boston	Orange and white	Tall	x	x	x	
D		Ballon	Severin	Brown-rose	Short		x		
P		Baron G. de Grancy	Hornsveld	White		x			
D	x	Beatrice Slocombe	Slocombe	Red, edged old gold	Short	x	x	x	
Pom.	x	Belle of Springfield		Red	Short	x	x		
DC		Beloit		Crimson		x			
D		Ben Wilson	Murphy	Orange-red tipped gold				x	
PD	x	Berch van Heemstede		Yellow		x		x	
P		Bertha Paulding	Alexander	Rose pink		x			
D	x	Bertha Story	Hayden	Pure pink				x	
PD		Bertha von Suttner	Hornsveld	Salmon, shaded yellow			x	x	
D		Bessie Boston	Leedham	Red				x	
Dup.		Big Chief		Red		x			
Ch.	x	Bianca	Warnaar	Rosy lilac		x	x	x	
Pg.		Billionaire	Stillman	Orange	Short			x	
D		Bloemhoven		Lilac		x		x	
D		Blue Oban		Mauve			x	x	
D	x	Bonnie Brae	Bromall	Pink and cream	Short			x	
B		Bon Ton	Wilmore	Red		x			
D		Bonnie	Stout	Bright cerise	Tall	x	x		

Ch.	Break o'day	Maytrott	Sulphur yellow		x	x	x
D	Breezelawn		Red	Short	x		
B	Bride		Pink tipped rose	Short	x		x
C	British Lion	Stredwick	Yellow, burnished red	Tall			x
C	Britannia	Keynes	Salmon, suffused pink		x	x	
C	Brunhilda	Goos & Koene-mann	Plum			x	
Pom.	Brunette		Crimson, blotched white			x	

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

C

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
Pg.		Cæcilia		Creamy white		x			
PD		California	Hornsveld	Deep yellow				x	
Chg.	x	California Enchantress	Boston	Pale pink	Tall	x	x	x	
Dg.		Cambria	Burrell	Blush pink		x	x	x	
D		Cameo	Stout	Blush pink and white			x	x	
Pg.		Canopicus	Stillman	Dark cerise			x	x	
Col.		Canopus		Pale lemon yellow, collar white		x	x		
S		Cardinal Century		Red		x			
P	x	Carl Purdy	Vanderbilt	Scarlet	Tall	x		x	
Al.		Carola		Carmine rose		x	x		
D	x	Carolyn Wintjen	McWhirter	Salmon pink	Short		x	x	
Pom.		Catherine		Yellow		x	x		
D	x	Catherine Cooper	Bromall	Rosy lavender	Short			x	
D		Catherine Duer		Red		x	x	x	
D		Catherine Wilcox	Marean	White tipped cerise				x	
C		Charles Clayton	Wilmore	Red		x			
Bg.		Charles Lanier		Dark yellow		x	x	x	
C		Charles Woodbridge	Ware	Red		x			

D		Charity Slocombe	Slocombe	White	Tall				x
P	x	Chatenay		Pink		x	x		
D		Chieftain	Slocombe	Crimson and pink					x
P		City of Portland	Gill	Yellow					x
B	x	Clara Seaton	Reidy-Doolittle	Golden bronze	Tall				x
Ch.		Claremont	Salbach	Cream pink					x
P		Clear Sky		White, yellow centre		x	x		
P		Cleopatra	Burrell	Red marked yellow		x			
D		Clifford W. Bruton		Yellow		x			
C		Clincher	Stredwick	Heliotrope					x
C		Cockatoo		Yellow and white		x	x		
Ch.	x	Colossal Peace	Maytrott	Pink and white	Tall				x
D	x	Copper	Doolittle	Copper shaded bronze	Tall				x
C		Coral	Burrell	Coral red		x			
D		Corona	Wilmore	White		x	x		
C		Coronation	Keynes	Vermilion		x	x		
C	x	Countess of Lonsdale	Keynes	Salmon, tinted apricot	Short	x	x		
C		Country Girl		Deep golden yellow, amber tips			x		
S	x	Crawley Star	Cheal	Coral pink		x	x		
S		Cream Century		Creamy white		x			
P.		Cream King	West	Soft cream					x
P		Creation		Cherry red	Tall	x			
C		Crépuscule	Rivoire	Apricot					x
C	x	Crystal	Stredwick	Pink		x	x	x	
Bg.		Cuban Giant		Deep crimson					x
C		Curlew	Burrell	Old rose					x
Dg.		C. W. Hayden		Purple					x
C		Cygnet	Burrell	Lemon yellow					x

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

D

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
M		Daffodil	Cheal	Yellow	Dwarf	x			
C		Dainty	Hobbies	Yellow, suffused pink golden tips		x			
M		Daphne	Cheal	Maroon	Dwarf	x			
D		Dakota	Marean	Flame red	Short			x	
Pom.		Darkest of all	West	Maroon			x		
Pom.		Darkness		Maroon			x		
D		Darlene	Alexander	Shell pink, white centre		x	x		
B		David Warfield		Cherry red		x		x	
M		Dazzler	Cheal	Red	Dwarf	x	x		
Bv.		Dazzler	Keynes	Red and yellow mixed		x		x	
P		Debonair		Cerise and gold		x		x	
DPg.		Dee-lighted	Childs	White			x	x	
Dg.		Defiance	Burrell	Salmon cream		x	x	x	
D		Delia V. Potter	Bromall	Lavender and white				x	
D	x	Délice	Charmet	Bright pink		x	x	x	
Col.		Diadem	Goos & Koenemann	Carmine, collar white		x			
Ch.	x	Dictator	Burrell	Lavender and fawn			x	x	
Col.		Director René Gérard		Creamy white, marked purple, collar white		x	x		

B		D. M. Moore	Wilmore	Deep maroon				x
P		Doctor Henry Sewell	Wilmore	Pink and fawn	Tall			x
P		Doctor H. H. Rusby	Wilmore	Bright lemon				x
D		Doctor H. Tevis	Pelicano	Salmon rose				x
Ch.		Doctor Mene		Amber and yellow		x	x	x
Pg.		Doctor Peary		Reddish mahogany	Flowers Pendent	x		x
C		Doctor Roy Appleton	Stredwick	Yellow and salmon	Pendent			x
C		Dora	Cayeux	Red salmon	Short	x		
C		Dorothy Durnbaugh	Broomall	Deep pink		x		x
C		Dorothy Hawes	Stredwick	Crimson	Tall, flowers Pendent			x
B		Dorothy Peacock	Peacock	Clear pink		x	x	
D	x	Dragoon	Burrell	Crimson		x	x	x
Bg.		Dreer's White	Dreer	White	Short			x
Bg.		Dreer's Yellow	Dreer	Sulphur yellow				x
DP	x	Duchess of Brunswick	Hornsveld	Rose		x	x	x
D		Dudley C. Hathaway, 2nd.	Hathaway	Creamy yellow, white tips	Short			x
C	x	Duffryn	West	White		x		x

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Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

E

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
C		Earl of Pembroke		Purple		x			
Pom.		Early Snow		White			x		
Sgv.		Eckford Century		White, spotted crimson	Tall	x	x		
C		Ebony		Maroon		x			
P		Edith Cavell	West	Orange, shaded old gold				x	
D		Edna Story	Story	White and pale pink		x			
D		Edward Parrott		Purple			x	x	
C		E. F. Hawes	Stredwick	Salmon pink	Flowers Pendent	x		x	
C	x	Effective	Hobbies	Primrose and amber		x	x		
P	x	Elsa	Lohrman	White		x		x	
C		Else	Crass	Salmon pink, suffused yellow		x			
B		Elsie Burgess		White, suffused lavender			x		
B		Emily May		Buff		x			
D	x	Emily D. Renwick	Stout	Iridescent rose	Short Bushy	x	x	x	
B		Estelle Christy		Clear deep golden yellow			x		
P		Enchantress	Burrell	Silvery pink		x		x	
Ch.	x	Etendard de Lyon	Rivoire	Carmine and purple				x	

C		Ethel Schriver	Alling	Creamy yellow					x
M		Etna	Cheal	Crimson scarlet		x	x		
C		Etruria	Stredwick	Reddish apricot		x			
C		Eureka		Purple		x			
D		Exmouth Glory		Reddish apricot and orange, tipped white					x

Notes

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Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

F

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
C		Fairy	Stredwick	Ivory white		x			
Pom.		Fairy Queen		Sulphur, edged pink		x	x		
S		Fang de Charmer	Stillman	Pink	Tall	x			
P		Fantastique	Mastic	Crimson, tipped and bordered white				x	
Pom		Fascination		Pink and lavender	Short	x	x		
C		Fernand Olivet	Nonin	Maroon, centre black		x	x		
P	x	Fiery Cross	Slocombe	Scarlet		x		x	
P		Flaming June	Hathaway	Yellow, shaded crimson				x	
C		Flora	West	Pure white		x			
C		Floradora	Humphries	Dark red		x			
C	x	Florence M. Stredwick		Pure white	Flowers Pendent			x	
P		Forest Loma	Stillman	Deep cerise pink, streaked yellow				x	
P		Frances Loma	Stillman	Light lavender red				x	
D		Frank A. Walker	Alexander	Deep lavender pink		x			
FB		Frank Smith	Schmitz	Maroon, tipped white				x	
D		Franz Ludwig	Ludwig	Lavender pink				x	
P		F. R. Austin	Peacock	Creamy yellow and crimson	Tall			x	

C		Frederick Wenham	Stredwick	Bronze	Tall			x
S		Fringed Century		Carmine		x		
D	x	Futurity	West	Old rose	Tall	x	x	x
C	x	F. W. Fellows	Stredwick	Orange rose	Tall	x		x

Notes

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Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

G

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
Ch.	x	G. A. B. S.	Spencer	Orange	Tall			x	
C		Galliard		Scarlet crimson		x			
Pom.		Gannymede	Turner	Buff, tinted pink			x		
Col.		Geant de Lyon	Rivoire	Maroon, collar white		x	x		
Pg.	x	Geisha	Hornsveld	Scarlet and gold	Flowers Pendent	x		x	
S		Geisha Century		Yellow and scarlet		x			
P		Geishanola		Yellow and scarlet		x			
P		Geisha Superba		Red and yellow		x			
C		General Buller		Cardinal, tipped white		x			
D		General Custer		Red and yellow		x		x	
Bv.		General Miles		Violet striped and spotted magenta		x			
D		General Joffre	West	Maroon	Tall	x			
C		Gen. Sir Douglas Haig	Stredwick	Pink		x		x	
C		Genista		Deep amber		x			
C		Genoveva		Primrose yellow		x			
P		George H. Mastick	Tyler	Maroon, tipped red				x	
Ch.	x	George Walters	Carter	Salmon pink, shading to yellow at base		x	x	x	

Ch.		George H. Stillman	Stillman	Dark red				x
P	x	Gertrude Dahl	Stout	Opalescent pink		x	x	x
D		G. H. Carr	Titus	Purple with velvety reflex				x
S		Gladys Century		Crimson, pink and white		x		x
Ch.	x	Gladys Sherwood	Bromall	White		x	x	x
D		Glorieux	Mastick	Golden yellow, bronze centre		x	x	
P		Gloire de Baarn	Hornsveld	Pink		x		
D		Glory of New Haven	Slocombe	Pinkish mauve	Tall			x
B		Gold Medal		Yellow, tipped red		x		x
S		Golden Century		Yellow		x		
Ch.		Golden Gate	Finger	Yellow, shaded darker	Tall	x	x	x
B		Golden Shore	Stillman	Yellow, shaded pink		x		x
Dup.	x	Golden Sunshine	Stout	Golden, overlaid salmon	Tall	x	x	x
C		Golden West	Bromall	Amber, shaded to bronze			x	x
C		Goldland		Yellow		x		
Ch		Goliath		Apricot, tinted rose pink	Tall	x	x	x
D		Governor Wilson		Red		x		
Col.		Grace Loretta	Stillman	Purple, collar white		x		
Bg.		Grand Duke Alexis		White, tinted lavender		x	x	x
Pom.	x	Gretchen Heine		Blush white, rose tips		x	x	
Pom.		Gruss Am Wein		Crushed strawberry			x	
C		Guardian	Burrell	Crimson scarlet				x
C		Gui-hui-taku		Lemon				x

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

H

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
P		Hampton Court		Bright mauve pink	Tall	x	x		
D		Hannah May		White		x	x		
D		Harry Davidson	Estes	Mulberry and white				x	
Ch.	x	Helen Durnbaugh	Bromall	Blush		x	x	x	
S		Helvetia		Red and white stripes		x			
C		Henri Cayeux	Cayeux	Old gold		x		x	
Col.		Henri Farman	Stredwick	Yellow, blending red, collar cream		x	x		
D		Henri Patrick		White		x			
Ch.		Herbert Slocombe	Slocombe	Lilac pink				x	
C		Holista		Orange, tipped scarlet		x			
P		Hortulanus Budde		Red		x			
Dg.	x	Hortulanus Fiet	Hornsveld	Salmon, shading yellow	Short	x	x	x	
D		Hortulanus Witte	Hornsveld	Pure white			x	x	
Pv.		Howitzer	Boston	Yellow, splashed scarlet	Tall			x	
C		H. Shoesmith		Vermilion scarlet				x	
D	x	Humoresque	Stout	Bronze, reverse rose	Tall	x	x	x	

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

I

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
Pa		Iliad	Burrell	Buff				x	
Dg.	x	Insulinde	Kriest	Golden brown	Tall		x	x	
C		Ivory White	West	White			x	x	

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

J

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
S		Jack		Red		x			
D		Jack Rose	Peacock	Red		x	x		
B		James Vick	Keynes	Pink		x			
D		Jane Selby	Boston	Mauve pink	Short	x	x	x	
C		Jealousy		Yellow		x			
DB		Jean Kerr	Burpee	White			x		
D	x	Jeanne Charmet	Charmet	Pink lilac	Tall	x	x		
Ch.	x	Jeanne Francour	Mastick	Copper and bronze		x	x		
Sg.		Jessie	Peacock	Snow white		x			
Ch.	x	J. Harrison Dick	Stout	Corn-coloured, picoteed lavender edge	Tall	x	x		
Cl.		J. H. Jackson	Vernon-Barnard	Almost black		x	x		
Dg.		J. K. Alexander	Alexander	Violet purple				x	
D	x	Joffre	Rozain-Boucharlat	Pink, shaded white	Tall	x	x	x	
C		Johannisburg	Stredwick	Gold		x			
Col.		John Bull	Stredwick	Crimson with yellow disc, collar white		x			
P		John Green	Green	Yellow and scarlet		x	x	x	
D		John H. Slocombe	Slocombe	Deep red				x	

Dv.		John Lewis Childs	Boston	Yellow, splashed red				x
Cg.		John Riding	Stredwick	Crimson				x
B		John Thorpe		Pink		x		
B		John Walker	Walker	Snow white			x	
PD		John Wanamaker	Peacock	Orchid pink		x	x	
C		John Woolman	West	Scarlet, shaded rose		x		
D		Jonkheer Boreal	Hornsveld	Orange red		x	x	x
C		Juarezii	Original cactus dahlia	Crimson		x		
M		Jubilee	Cheal	Pink		x		
D	x	Judge Marean	Marean	Orange and red	Short	x	x	x
C		Juliet	Keynes	Rosy pink with lighter centre		x		
Cv.		Jupiter	Stredwick	Yellow, salmon tips striped red		x		x
Ch.		Justice Bailey	Willmore	Pink		x		x

Notes

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Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

K

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
Cgh.	x	Kalif	Engelhard	Bright red	Tall	x	x	x	
BF		Keystone		Lilac pink penciled crimson		x			
D		Khaki		Buff		x			
D		King of Commerce	Kunzman	Tango and orange			x		
B		King of Shows	Stillman	Yellow	Short	x		x	
D		King of the Autumn	Hornsveld	Gold and pink	Type Unstable	x	x	x	
S		Koerner's White		White		x			
C		Kriemhilde	Goos & Koenemann	Pink and white		x	x		
Pom.		Kleine Domitea		Buff		x			

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

L

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
P		Lady Alla	Mastick	Scarlet				x	
P		Lady Betty	Marean	Pink and white		x		x	
D	x	Lady Helen	Stillman	Bronzy pink, suffused white	Tall	x	x	x	
Ch.		La Favorita	Lohrmann	Brilliant salmon	Tall	x		x	
Col.		La Fusse		Oxblood red, collar white		x			
P		La Glorietta	Bromall	Yellow and pink	Short	x		x	
A		La Styx		Maroon tipped gold		x			
D		Lavendere	Burbank	Lavender pink				x	
C		Lawine	Goos & Koenemann	Flesh white		x		x	
B		La Colosse		Red				x	
Dv.		Le Grand Manitou	Charmet	White spotted, deep violet				x	
D		Lemon Beauty		Lemon yellow		x			
D		Les Allees		Pinkish white striped purple		x			
C		Libelle		Lavender		x	x		
Pom.		Little Beeswing	Keynes	Deep cherry, shading yellow		x	x		
Pom.		Little Bessie		Creamy white		x	x		

Pom.		Little Herman		Cardinal red, tips white		x	x	
Pom.		Little Jennie		Primrose yellow		x	x	
Pom.		Little Pepito	Spencer	Rose red			x	
D		L. Kramer Peacock	Peacock	White		x	x	
P		Luria d'Ora	Wilmore	Red, shaded yellow		x		x
SC		Lord Goff		Cream, tips rose pink		x	x	
C		Lorna Doone	Stredwick	Pink and yellow		x		
Dv.		Lucy Fawcett		Pale yellow, rose stripes	Tall	x	x	x
D		Lucy Langdon	Stout	Lavender	Bushy	x	x	
D		Lyndhurst		Red		x		

Notes

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Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

M

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
D	x	Mabel B. Taft	Boston	Pinkish apricot	Short Bushy	x	x	x	
D		Madame A. Lumiere		White, tips violet red			x		
C	x	Mme. Annette Reynault		Bright rose	Tall	x	x		
C		Madame Bertha Gemen		Currant red, suffused yellow				x	
P	x	Madame D. van Bijstein		Lilac		x	x		
Col.		Madame E. Poirier	Charmet	White, collar purple and white		x	x		
C		Mme. Eschenauer		White, suffused lilac		x			
C		Mme. Henri Cayeux	Cayeux	Pink and white				x	
Dup.		Madame J. Coissard	Charmet	Cerise and white	Short	x			
P		Madame Theresa Steinert	Hathaway	Blood red				x	
D		Madame Van Den Daele		White edged pink			x	x	

P		Madame Van Loon		Orange			x	
S		Mme. X	Stillman	Purple and white		x		
Pom.		Madeline		Primrose, edged rose purple		x	x	
D	x	Madonna	Ware	Pinkish white		x	x	x
C	x	Magnificent	Broomall	Orange and copper		x		x
Dv.		Maid of Kent	Cannell	Cherry red, tips white		x	x	
S		Major Mitchell		Pink		x		
S		Man Friday		Maroon		x		
Dg.		Manitou	Wilmore	Amber bronze			x	x
D		Manzanola	Wilmore	Red		x		
D	x	Maréchal Foch	Spencer	Red and gold	Tall	x	x	x
Pom.	x	Marguerite Bouchon	Cayeux	Deep rose, white centre and tips		x	x	x
C		Marjorie Castleton		Rose pink, white centre			x	
Dg.		Marjorie Field		Pink, shaded rose			x	x
C		Master Carl		Orange		x		
P		Mary Jean Warner	Mastick	Golden yellow				x
DP.	x	Masterpiece	Wilmore	Pale old gold			x	x
B		Maude Adams	Alexander	White, overlaid pink	Tall		x	
Col.		Maurice Rivoire	Rivoire	Crimson, white collar		x	x	x
D	x	Medusa	Burrell	Salmon and cream		x	x	x
A		Meissonier		Salmon	Short		x	x
C	x	Melody	Stredwick	Yellow, tips white	Pendent	x	x	x
D		Mephisto		Velvety crimson				x
Ch.		Mephistopheles	Marean	Red and gold	Tall			x
Cv.		Mercury		Yellow, striped crimson		x		
Dup		Merry Widow (Lustige Wittive)	Mann	Cerise red	Tall	x		
P		Meyerbeer	Nonin	Purple	Tall			x
P		Mignon	Lohrmann	Mauve		x		
D	x	Mildred Slocombe	Slocombe	Pink		x	x	x

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
D	x	Mina Burgle	Burgle	Bright red		x	x	x	
Ch.	x	Minnesink	Stout	Blood red		x	x	x	
D		Minos		Maroon		x			
D		Miss Edna L. Hathaway	Hathaway	Old gold				x	
P		Miss Keeling		Mauve, shaded amber		x		x	
D		Miss Leota Cota	Broomall	Buff and pink	Short	x	x	x	
B		Miss Minnie Vosburg	Dreer	White			x		
D		Miss Minnie McCullough		Buff		x			
Bv.		Miss Titus		Fawn, striped crimson			x		
C		Mlle. Marie Doucet		Mauve pink		x			
P		Mlle. Yvonne Tesier	Hathaway	Salmon pink, yellow base				x	
P		Mondschiebe	Goos & Koenemann	Yellow	Short		x	x	
Al.		Monsieur Ch. Molin		Cream	Dwarf	x			
PD.		Monsieur Hoste		Rose carmine		x			
D		Monsieur Lenormand	Charmet	Yellow, striped red, tipped white				x	
Col.		Monsieur L. Ferard		Claret, edged white		x			
D		Mont Blanc		White		x			

C		Mont Blanc	Krelage	White		x		
D		Morocco		Dark maroon, tipped white		x	x	x
C		Mount Fuji		White		x		
Ch.	x	Mount Shasta	Stillman	Pink	Tall	x		x
P		Mrs. Bowen Tufts	Alexander	Rose purple		x		
Dg.	x	Mrs. Carl Salbach	Salbach	Lavender pink			x	x
C		Mrs. Charles Scott		Yellow		x		
PD.		Mrs. Charles L. Seybold	Vincent	Crimson, marked white		x	x	
C	x	Mrs. C. Cooper	Burrell	Apricot		x	x	x
C		Mrs. Douglas Fleming	Stredwick	White		x		x
Ch.	x	Mrs. Edna Spencer	Spencer	Lavender pink	Tall	x	x	x
D		Mrs. F. C. Burns	Burns	Shell pink		x	x	x
P		Mrs. Flossie M. Trafton	Hathaway	Coral, suffused white and yellow		x		
D		Mrs. George Reed		White, tipped pink		x	x	
P		Mrs. G. Gordon		Creamy white	Short	x		x
D		Mrs. Hartong	Wilmore	Buff		x		
C		Mrs. Henry Randle	Stredwick	Pink and yellow				x
C		Mrs. H. J. Jones		Scarlet, tips white		x		
C		Mrs. H. Shoesmith	Struck	White		x	x	
D		Mrs. H. W. Struck	Struck	White	Bushy	x	x	x
Cv.		Mrs. J. Emberson		Lemon, speckled pink		x	x	x
P	x	Mrs. Jessie L. Seal	Gleadel	Old rose	Tall	x		x
D		Mrs. J. Gardner Cassatt		Bright cerise		x	x	
C		Mrs. J. Harrison		Crimson				x
S		Mrs. Joseph Lucas	Peacock	Yellow, overlaid scarlet, suffused salmon		x		
C		Mrs. Jowett		Fawn		x		

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
B		Mrs. Langtry	Keynes	Red and white		x			
D		Mrs. Lillian Thistle	Lowell	Scarlet				x	
D		Mrs. Lille P. Hathaway	Hathaway	Orange				x	
C	x	Mrs. Margaret Stredwick	Stredwick	Pink	Tall	x		x	
Ch.		Mrs. Richard Lohrmann	Lohrmann	Golden yellow	Tall			x	
D		Mrs. Roosevelt		Pink	Short		x	x	
D.		Mrs. R. R. Strange	Boston	Copper				x	
B		Mrs. Sounders	Turner	Yellow, tipped white		x	x		
Cg.		Mrs. Stephens	Stredwick	Pale primrose				x	
D		Mrs. Vernon Castle	Clark	Shrimp pink		x			
C	x	Mrs. Warnaar	Hornsveld	Faint flesh pink			x	x	
Ch.	x	Mrs. W. E. Estes	Estes	Pure white	Tall	x	x	x	
D		Mrs. Wm. Roberts	Slocombe	White, tipped mauve	Short	x			
D		Mrs. Winters	Wilmore	Snow white		x	x		
Dg.		Mrs. Woodrow Wilson	Jones	Vermilion, suffused white and yellow				x	
D		Musconetcong		Pink		x	x		

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
P		Naid	Wilmore	Cream pink				x	
Cv.		Nashoon	Hathaway	Pink, splashed crimson				x	
Pg.		Natalie Mai	Boston	Burgundy, creamy pink edges				x	
D		Nellie Stewart		White		x			
Pom.		Nemesis		Red, white edges			x		
Pom.		Nerissa	Turner	Soft pink			x		
C.		Nerthus	Goos & Koenemann	Rose		x			
S		Newport Gem	Robertson	Pink and violet	Short	x			
S		Newport Wonder	Robertson	Rose		x			
Ch.		Nibelungenhort	Goos & Koenemann	Old rose				x	
Dup.		Nikko		Salmon pink	Tall	x			
P	x	Nine of Spades	Stout	Blood red	Tall	x		x	
P		Ninigret	Stillman	Dark red, striped lighter		x			
M		Niveus	Cheal	White		x			
Pv.		Nokomis	Stillman	White and yellow, speckled red		x			
P	x	Norah Lindsay	West	Dove colour		x	x		
S		Northern Star		Satiny rose		x			
B		Nymphea		Pink and white		x	x		

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

O

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
D		Oban		Mauve, shading to fawn		x			
M		Olive	Cheal	Orange		x			
D		Orator		Salmon buff, blotched white		x			
DPg.		Oregon Beauty		Intense Oriental red	Pendent	x			
Dv.		Orra Daw		Maroon, tipped white				x	
B		Ox Blood	Stillman	Red		x		x	
D	x	Osam Shudow	Boston	Lavender pink	Tall	x	x	x	

Notes

Class	Especially Desirables	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

P

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
D		Pacific	McWhirter	Cream, shading pink				x	
Pg.	x	Pacific Glow	Burns	Pink				x	
P		Painted Lady	Stillman	Pale rose		x			
D		Papa Treyne		Red		x	x		
D	x	Patrick O'Mara	Vincent	Tawny orange	Tall	x	x	x	
C	x	Peace	Broomall		Short	x		x	
CP	x	Peg O'My Heart		Mauve		x			
M		Pembrook	Cheal	Yellow	Short	x			
C		Pennant	Stredwick	Coral				x	
Ch.		Penelope van Princess	Stout	Salmon	Short		x	x	
D		Perfect Beauty	Stillman	Red and white				x	
CD		Perle de Lyon	Rivoire	Pure white		x	x		
C		Phenomenal	Stredwick	Salmon and yellow				x	
P		Phidias	West	Blush pink		x			
Pom.		Phoebe	Keynes	Orange, blending to crimson		x	x		
C	x	Pierrot	Stredwick	Amber shaded darker, tips white	Tall, flowers pendent	x	x	x	
D		Pink Velvet		Pink		x			
D	x	Polar Star	West	White		x	x	x	

C		Pollyanna		Pure white	Tall	x		x
Sv.		Praxitelles		Violet maroon, marked white		x		
Col.		President Vigor	Rivoire	Garnet, collar white		x		
Dg.		President Wilson	Jones	Vermilion, tips white				x
P		Pretoria		Red, yellow at base		x		
D		Pride of California	Lohrmann	Red	Tall			x
S		Prince Ferdinand de Bulgarie	Rivoire	Edges scarlet, centre pure white	Short	x		
C	x	Prima Donna	Shoesmith	White				x
C	x	Prima Donna	Nonne & Hoepker	Lavender and white		x	x	x
D		Princess Juliana	Hornsveld	White			x	x
D	x	Princess Pat	McWhirter	Old rose		x	x	x
B		Princess Victoria		Yellow		x		
C		Princess Yetive		Pink, shaded amber		x		
D		Priscilla	Hodgens	White and pink	Bushy			x
Dv.		Professor Mansfield		Yellow, white tips, red centre		x		
D		Progress		Lavender blotched crimson		x	x	
D		Proxy		Cherry red				x
D		Purple Manitou		Deep purple		x		x

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

Q

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
P		Queen Emma		Pink	Tall	x			
P		Queen Esther	Stillman	Red		x			
C		Queen of Hearts		Pure white, yellow base		x	x		
B		Queen of the Belgians	Rawlings	Cream, tips pink				x	
B		Queen Victoria		Yellow		x			
Pom.		Queen of Whites	Turner	White		x	x		
P		Queen Wilhelmina	Hornsveld	Pure white		x	x		
P		Quentin Durward	Mastick	Lemon yellow, marked crimson				x	

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

R

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
S		Rantendelin		White and deep crimson		x			
C		Red Feather		Red		x	x		
B		Red Huzzar		Red		x			
C		Red Triangle		Red		x			
Col.		Regularity	Stredwick	Purplish crimson, collar white and purple		x			
Ch.		René Cayeux	Cayeux	Ruby crimson	Short			x	
B		Reine Charlotte		Purple crimson		x			
Bv.		Rev. J. B. M. Camm	Keynes	Yellow, striped scarlet				x	
C		Rev. R. D. Williamson		Crimson		x			
Cg.		Rev. T. W. Jamieson	Stredwick	Mauve pink, salmon base	Tall	x		x	
C		Rheinischer Frohsinn	Goos & Koenemann	Pink mauve		x	x	x	
Ch.		Rheinkönig	Goos & Koenemann	White	Tall	x	x		
C		Richard Box	Stredwick	Primrose yellow			x	x	
P		Riesen Edelweiss	Mann	White		x		x	
P		Roem van Nijkirk		Dark purple				x	

D		Rosa Nell	Broomall	Bright rose	Short	x		x
D	x	Rookwood	Boston	Deep pink		x	x	x
Bg.		Rose		Deep rose		x		x
S		Rose pink Century	Peacock	Deep pink		x		
C		Rosy Morn		Bright carmine rose	Short	x		
C		Ruth Gleadell	Seal	Yellow, shaded pink				x
Ch.		Ruth van Fleet	Stillman	Canary yellow		x	x	

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

S

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
C		Saint Elias	Mastick	White				x	
Ch.		Salome Jane	Lohrmann	Old gold and red		x		x	
Ch.		San Francisco	Lohrmann	Reddish bronze		x	x	x	
D		San Mateo	Boston	Var. red and yellow				x	
Col.		San Mateo Star	Boston	Cerise, collar white				x	
Pom.		San Toy	Turner	White			x		
Dg.		Satyr	Burrell	Red and buff				x	
C		Scorpion	Stredwick	Yellow				x	
C		Secretaire Fuld		Yellow, tipped red		x			
Ch.		Seahorse	West	Yellow	Tall	x			
D		Secu		Crimson			x		
C		Sequoia		Indian yellow, suffused red		x			
D		Sequoia Gigantea	Burns	Yellow	Tall			x	
P	x	Shantung	Stout	Red and gold	Tall	x	x	x	
D	x	Shudow's Lavender	Boston	Lavender	Tall	x	x	x	
D		Sister Theresa	Mastick	Sulphur white				x	
Pom.		Snowclad		White		x			
C		Snowdrift	Howard & Smith	White				x	
D	x	Snowdrift	Broomall	White	Short	x	x	x	
C		Snowstorm	Stredwick	White		x			

P	South Pole	Cannell	White	Flowers Pendent				x
Col.	Souvenir de Chabanne	Rivoire	Yellow, tips carmine	Tall	x	x		
P	Souvenir de Franz Lizst		White and crimson		x			
Dg.	Souvenir de Gustav Doazon	Bruant	Orange scarlet	Tall				x
Sv.	Spanish Century		Yellow, pencilled red		x			
C	Standard Bearer	Keynes	Red	Short	x			
D	Starlight	Wilmore	White with red stripes		x			
B	Storm King		White		x			x
B	Striped Banner		Crimson, tipped white		x			
D	Sulphurea	West	Sulphur yellow		x	x		
D	Sunbeam	Slocombe	Red, striped gold		x	x	x	
B	Sunburst		Salmon		x	x		
D	Sunshine	Keasing	Red	Short	x			
Dup	Sunshine (See Golden Sunshine)							
B	Surpasse Colosse		Scarlet carmine		x			
Col.	Swallow	Stredwick	Petals and collar white		x	x		
C	Sweet Briar	Stredwick	Pink	Tall				x
D	Sylvia		Pink and white		x	x		

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

T

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Habit
C		T. A. Havemeyer		Red, yellow base		x			
D		Tenor Alvarez	Nonin	Rosy lilac, splashed brown				x	
C		T. G. Baker		Yellow		x			
B		The Baron		Yellow		x	x		
S		The Bride		White		x			
Ch.		The Eagle	Burns	Sulphur yellow				x	
D	x	The Grizzly	Burns	Dark maroon	Tall		x	x	
C		The Imp	West	Almost black	Short			x	
C	x	The Lion	Stredwick	Red and orange	Tall			x	
DP		The Magic Flower of "OZ"	Doolittle	Coppery yellow				x	
Dg	x	The Millionaire	Stillman	Lavender	Short			x	
Ch		The New Moon	Burns	Canary yellow, tips white			x	x	
C		The Quaker	Stredwick	Pinkish white		x		x	
S		Theries		White, striped violet			x		
Dv.		The Robert Ogden Fletcher	Brown	Yellow, white tips flecked red				x	
C		The Swan		White		x		x	
Bg.		Tillamook		Very pale pink		x	x	x	

B		T. N. T.		Red		x	x		
Pom.		Tom		Yellow		x	x		
Ch.		Tom Lundy	Fenton	Deep crimson	Tall		x	x	
Pom.		Tommy Keith	West	Cardinal, tips white			x		
Col.		Traymore		Red, collar yellow		x			
D	x	Trojan	Burrell	Maroon		x	x	x	
S		Twentieth Century	Peacock	Crimson	Tall	x			

Class	
Especially Desirable	
Name	
Originator	
Colour	
Habit	
Garden	
Cut Flower	
Exhibition	
Notes	

Notes

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

U

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
C		Uncle Tom		Maroon		x			
S		Union Jack		White		x			
C		Unique	Keynes	Deep red, tips white		x			

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

V

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
C	x	Valiant	Stredwick	Red	Tall, flowers pendent	x	x	x	
P		Van Dyke	West	Salmon, shaded heliotrope		x			
C		Vater Rhein		White		x	x		
C		Victor von Scheffel		Pink, edged rose		x			
Col.		Virginia Lee	Alexander	Carmine, edged yellow, collar yellow		x			
S		Violette		Purple red		x			
B		Vivian		White, edged violet	Short	x			
Pom.		Vivid	Turner	Red		x			

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
Ch.		Washington City	Broomall	White	Short			x	
Ch.		W. B. Childs		Blackish maroon				x	
Dv.		W. D'Arcy Ryan	Boston	Violet purple, tips white				x	
Dg.		W. D. Hathaway	Hathaway	Pink			x	x	
P		Weber		Mauve pink		x			
D	x	Westhope	Stout	Yellow, pinkish base	Tall	x	x	x	
S		White Century		White	Short	x			
S		White Lady	Slocombe	White		x			
S		White Star	Cheal	White		x			
S		White Sunshine	Stout	Pure white		x			
B		White Swan		White		x			
S		Wildfire Century		Red		x			
D		William Agnew		Red		x			
D		William Slocombe	Slocombe	Canary yellow				x	
Ch.		William Marshall	Stredwick	Dark yellow	Tall			x	
Pom.		Winifred		White, tips lavender		x	x		
C		Winsome	Hobbies	Creamy white		x			
Ch.		Wodan	Goos & Koenemann	Old gold shading to salmon		x		x	
C	x	Wolfgang von Goethe	Nonne & Hoepker	Pure salmon red		x	x		

D S B		World's Wonder Worth Star W. W. Rawson	Stillman Cheal Rawson	Golden salmon Old rose White, overlaid amethyst		x x	x x	x	

Notes

Class		Especially Desirable		Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

X

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
D		Xanthicus		Yellow		x			

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

Y

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
D		Yellow Brocade		Yellow		x			
D		Yellow Colosse		Primrose yellow		x	x		
S		Yellow Century		Yellow		x			
Ch.		Yellow King	Hornsveld	Yellow				x	
S		Yellow Star		Primrose yellow		x			
B		Yellow Duke		Yellow		x			
C		Yellow Gem	Hobbies	Yellow		x			
C		Yonaka		Deep maroon		x			
D		Ysleta	Broomall	Salmon and copper	Short			x	

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

Z

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes
Ch.		Zenobia	Du Bois	Purple	Short	x	x		
P		Zeppelin		Mauve		x			

Notes

Class	Especially Desirable	Name	Originator	Colour	Habit	Garden	Cut Flower	Exhibition	Notes

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